



COMPANY PROFILE

CAZ (Thailand) Public Co., Ltd.

AUG. 2019



TABLE OF

CONTENTS



1. Introduction	..... 3 Page
2. Business Area & Management System	..... 6 Page
3. Organization	..... 11 Page
4. Man Power Capability	..... 12 Page
5. Project Experience	..... 13 Page
6. Execution Capacity of each Disciplines	..... 43 Page
7. Shop Fabrication Division	..... 69 Page
8. Major Facilities	..... 88 Page
9. CAZ IT System	..... 98 Page
10. Quality Assurance	..... 114 Page
11. Safety Management System	..... 122 Page
12. Awards of Appreciation from Client	..... 128 Page



1

Intro Introduction



As of **February 2014**, CAZ (Construction A to Z) Company has established from executives and managerial **staffs who has extensive experiences and has completed numerous project as a well recognized EPC contractor in Oil & Gas, Petrochemical, Chemical, Energy, Power plants segments.**

Focusing on EPC and Fabrication works, we certainly would have an edge over other competitors since we have being executed and achieved successfully in many project in Thailand as by a delivery in-time management and program to minimize all losses but maximize quality **at a shortest period concerned.**

With our extensive experience, **CAZ (Thailand) Co., Ltd. has been launched since February 2014 as the company name represent for "CONSTRUCTION A TO Z"**



CONSTRUCTION A TO Z 's major business range is Construction Total Service & Management System (Procurement ,Construction and Shop Fabrication) to provide clients with the best possible service in all phases of project from A to Z including Civil & Architectural, Structural, Tank & Vessel and Heaters Fabrication work, Piping & Mechanical erection, Electrical, Instrument work regardless of project amount.

1

Intro

Introduction



Company Name

CAZ (Thailand) Public Co., Ltd.

CEO

Hong, Chung Sik

Established Date

06. Feb. 2014

Area

Land : 172,000 m²Shop : 30,000 m²

No. of Staff

EPC Biz Div. 267

Shop Biz Div. 52

Supporting Div. 18

Marketing 3

Total 340

Office & Fabrication Shop

239 Huaypong-Nongbon Road, T. Huaypong A. Muangrayong 21150, Thailand.

Tel : +66(0)38-606-242, Fax : +66(0)38-606-166

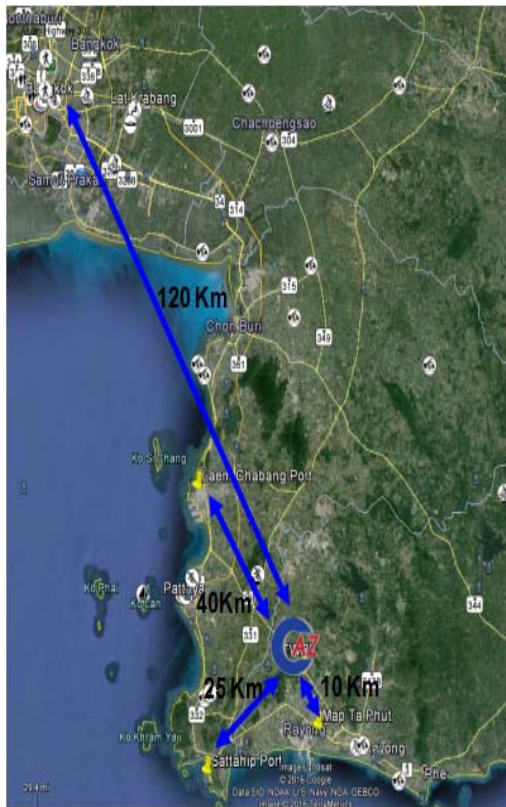
1

Intro Introduction



LaemChaBang	Sattahip	MapTaPhut
40 Km	25 Km	10 Km

- Office & Fabrication Shop
: Total Area(172,000 m²), Shop (30,000 m²)



Business Area & Management System

2. Business Area & Management System



EPC Project

Engineering

Construction

Procurement

Business
Portfolio

Shop Manufacturing

Shop Fab.

- Piping & Steel Structure
- Furnace & Heater

Vessel & H/Ex
Fabrication

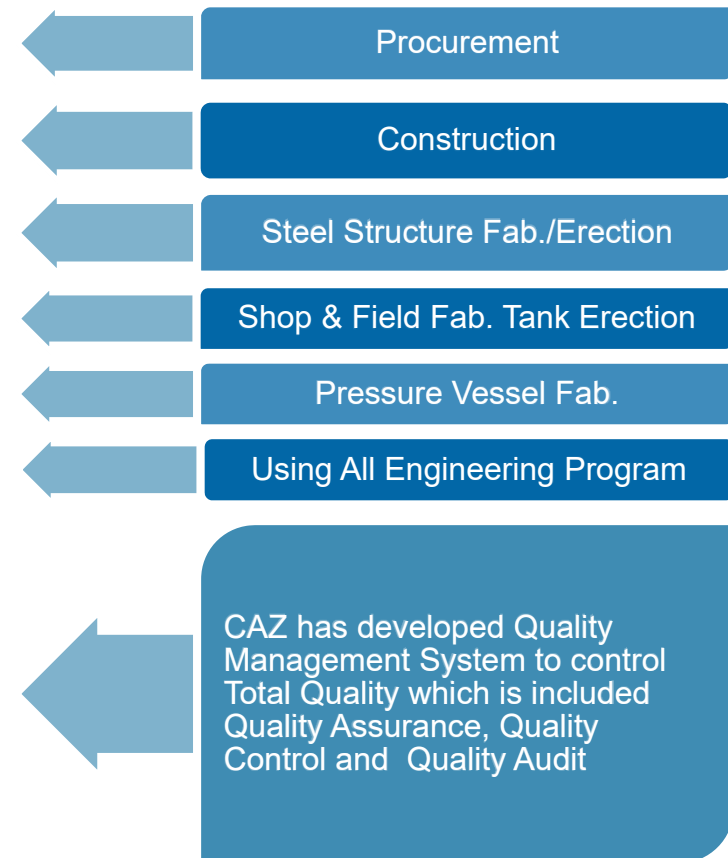
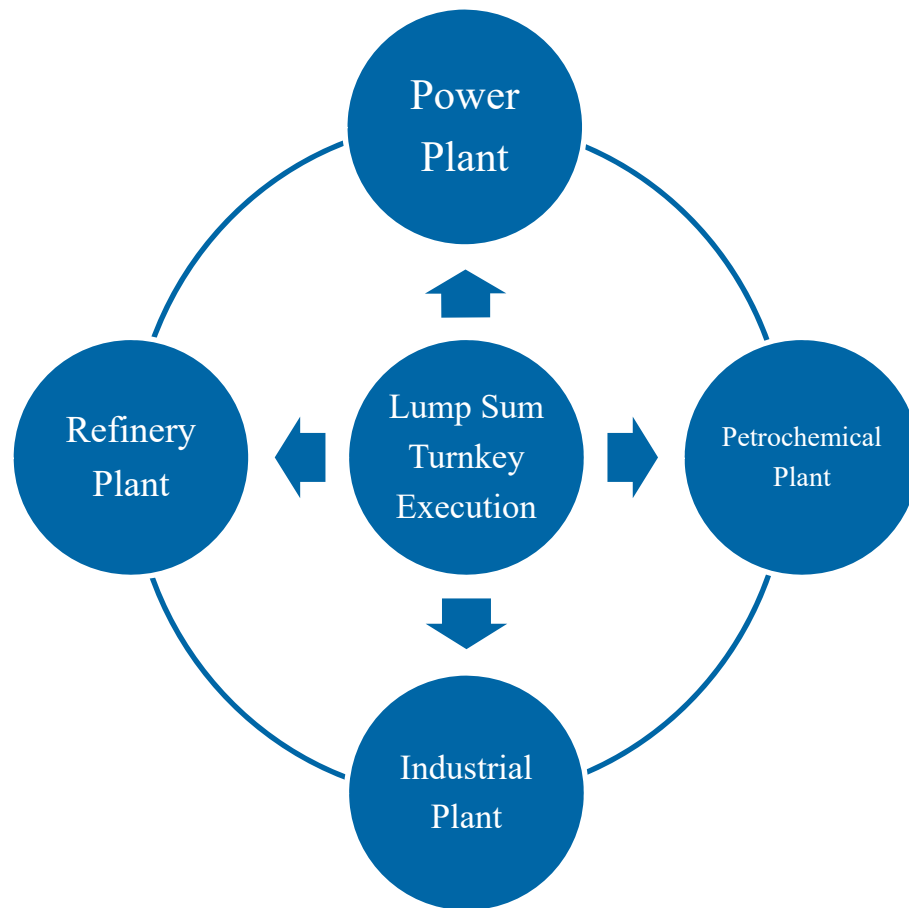
Tank
Fab & Erection

- CRT, DRT, FRT
- SPHERICAL

2. Business Area & Management System



CAZ's Market and Services



2. Business Area & Management System



Total Construction Service

CAZ's unique Construction(Construction & Procurement & Shop Fabrication) system was created to provide clients with the best possible service in all phases of project planning, feasibility studies, procurement, construction management, shop fabrication, commissioning, operation and maintenance.

Project Management System

Our company provides clients with flexibility in project organization and custom-tailors services to the requirement of each individual project. The most efficient organization is designed and mobilized with a team of qualified experts for each task and discipline.

All key staffs possesses specialized knowledge and expertise and has been specially trained to understand clients' needs and to communicate with clients effectively to achieve the best possible results.



2. Business Area & Management System



Team Work for Quality Management

The team work strategy is the one of CAZ's management methods which focuses every resources of the company on each project.

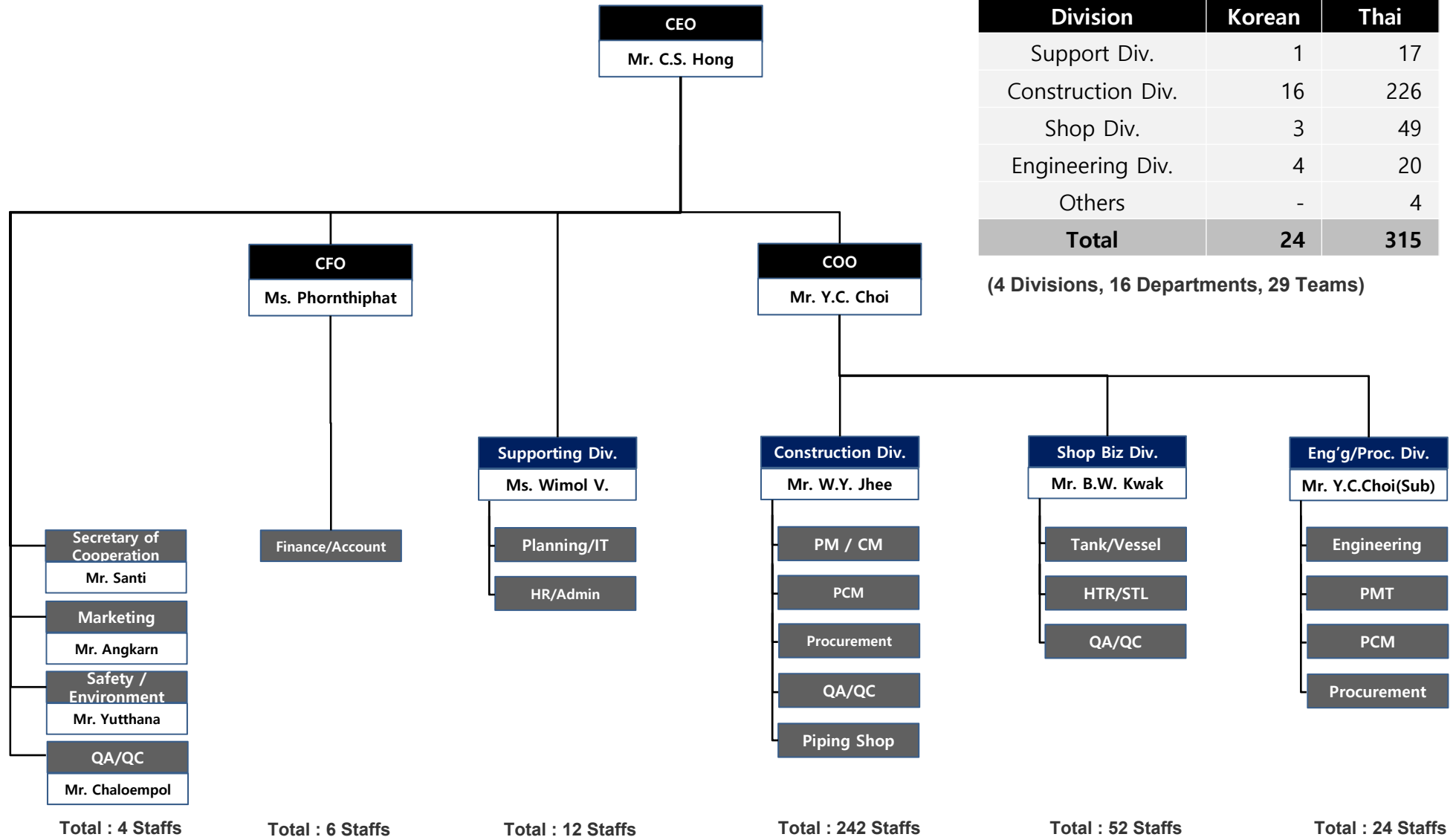
TEAM stands for **T**ogether **E**veryone **A**chieves **M**ore. Therefore, TEAM Building with the clients is the most important aspect for every projects. CAZ instigates, assists and monitors each project with Quality Management Policy.

- ✓ “CAZ” plan, do for client satisfaction.
- ✓ “CAZ” always deliver quality on time.
- ✓ “CAZ” are the best on Quality, Service and Price.



Division	Korean	Thai
Support Div.	1	17
Construction Div.	16	226
Shop Div.	3	49
Engineering Div.	4	20
Others	-	4
Total	24	315

(4 Divisions, 16 Departments, 29 Teams)



Man Power Mobilization Capacity

DICIPLINE	MAX. MOB. CAPABILITY
CIVIL / ARCH.	1,100
STRUCTURE FAB.	500
PIPING	1,200
STRUCTURE / MECH. INSTALLATION	400
ELEC. / INSTRUMENT	800
PAINT / SCAFFOLDING	300
TOTAL	4,300



* Experienced to Mobilize 4,500 workers in same date

Project Experience

of CAZ(Thailand) Public Co., Ltd.

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
Thai Oil LAB PJT	Thai Oil Co., Ltd / Hyundai Eng'g Co., Ltd. / Sriracha	Building Work (Recycle and Make Up Gas Compressor Shelter, Recycle Compressor Shelter, Air Compressor Shelter, Chemical Injection Package Shelter, Substation, Field Auxiliary Room, Gantry Shelter, NG Metering Station Shelter, Expansion of Flow Computer Building) Civil Work (Duct Bank and etc) Structure Fabrication & Field Erection Pipe Rack, Equipment Structure, Compressor Shelter (2,000 tons) Platform & Ladder Fabrication for Vessel & Tower (305 tons)	S May. '14 F Aug. '15	313 M
GSP#5 PJT WHRS Unit	PTT Public Co., Ltd. / Samsung Eng'g Co., Ltd. / Map Ta Phut	Structure & Mechanical & Piping Work For WHRS Unit	S May. '14 F Sep. '14	31 M
KHAO BO YA LPG TERMINAL PJT E&I Work	PTT Public Co., Ltd. / Samsung C&T Co., Ltd. / Khao Bo Ya	Electrical & Instrument Work of Refrigerated Tank Facilities	S Sep. '14 F Jan. '16	198 M
PLE Purple Line Building Facade	Power Line Engineering PCL. / Bangkok	Building Façade Work Structure Fabrication & Field Erection Work	S Sep. '14 F Apr. '15	22 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
TOP 202MW Small Power Producer PJT Building Package	Thai Oil SPP Co., Ltd.(TOP) / CTCL(Thailand) Co., Ltd. / Sriracha	Building Work , Substation, GTG Control Building, STG Control Building	S Sep. '14 F Jan. '16	197 M
PTT LNG Receiving Terminal Expansion PJT Phase II	PTT LNG Co., Ltd. / IHI Corporation / POSCO Engineering Co., Ltd. / Map Ta Phut	Civil Work , Equipment Foundation, Pipe Rack Pre-casting, Road Paving, Drainage Work Structure Fabrication & Field Erection Pipe Rack, Shelter, Platform (2,100 tons)	S Nov. '14 F Dec. '16	382 M
PTTGC Aromatic Debottlenecking Project	PTT Global Chemical PCL. / PTT ME Co., Ltd / Map Ta Phut	Field Piping Work (20,000 DB) & Structure Work	S Apr. '15 F Oct. '15	62 M
PTTME Annapurna Project	Vencorex Chemicals Co., Ltd / PTT ME Co., Ltd / Map Ta Phut	Steel Structure Installation Work (400 Tons)	S May. '15 F Jul. '15	6 M
PTT ASAHI SAR Project	PTT ASHAI Chemical Co., Ltd / Map Ta Phut	Civil, Structure, Equipment Erection & Piping Work	S Jul. '15 F Dec. '15	EPC 19 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
TSE ATV Project	Samsung Electronic / Samsung Eng'g Co., Ltd. / Sriracha	Civil, Structure Work	S Feb. '16 F Jun. '16	113 M
IRPC PPE Project	IRPC PCL. / Rayong	Civil, Electric Work	S Feb. '16 F Dec. '16	83 M
PTT Midline compressor project	PTT PCL. / CPP Co., Ltd / Khao Hin Son	Civil, Structure, Equipment Erection & Piping, E&I, Pre-comm. & Commissioning Work	S Apr. '16 F Apr. '17	480 M
PTTGC TA Project	PTT Global Chemical PCL. / Rayong	Piping Hot (PPH) & Piping Cold (PPC) Repair Work	S May. '16 F Jun. '16	15 M
PTT Tank Terminal	PTT Tank Co., Ltd / Map Ta Phut	4,000 Ton Propylene Spherical Tank and Facilities Work	S Dec. '16 F Aug. '18	EPC 332 M
PTT LNG 1.5 MTPA	PTT LNG Co., Ltd / POSCO Engineering Co., Ltd. / Map Ta Phut	Civil Work	S Jan. '17 F Jun. '17	31.1 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Contract Amount
PTT LNG Cold Water Facilities	PTT LNG Co., Ltd / Map Ta Phut	Procurement, Construction and Commissioning Work	S May. '17 F Jun. '18	EPC 721 M
Wangnoi Compressor Station Project	PTT PCL. / Samsung Eng'g Co., Ltd. / Wangnoi, Ayutthaya	Civil, Structure, Mechanical and Piping Work	S Jun. '17 F Oct. '18	372 M
PTT GC Site Preparation work Project	PTT Global Chemical PCL. / Samsung Eng'g Co., Ltd. / Map Ta Phut	Site Preparation Work	S Sep. '17 F Jan. '18	58 M
PTT LNG IPG Project	PTT LNG Co., Ltd / Samsung Eng'g Co., Ltd. / Map Ta Phut	General Contractor (Civil, BLDG, Structure, Mechanical, Piping, Electric & Instrument & Painting Work)	S Feb. '18 F Jan. '19	220 M
PTT GC PO Project	PTT Global Chemical PCL. / Samsung Eng'g Co., Ltd. / Map Ta Phut	Civil Work	S Feb. '18 F Dec. '19	456 M
Enclosed Ground Flare (EGF) Installation Project	Bangchak Petroleum / Zeeco, Inc / Bangchak	Ground Flare and Facilities Project	S Apr. '18 F Jun. '20	EPC 272 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Contract Amount
PTT GC Olefin Reconfiguration Project	PTT Global Chemical PCL. / Samsung Eng'g Co., Ltd. / Map Ta Phut	Structure Fabrication Work (6,060 tons)	S Mar. '18 F Aug. '19	297 M
PTT GC Olefin Reconfiguration Project	PTT Global Chemical PCL. / Samsung Eng'g Co., Ltd. / Map Ta Phut	Structure Erection (6,060 tons), Equipment Erection (13,230 tons) & Piping Work (573,200 DB) including Pipe rack Module work (33 sets, 2,890 tons)	S Mar. '18 F Apr. '20	1,189 M
BangPa-kong LPG Terminal Phase 3 Project	WP Energy PCL. / Takuni PCL. / BangPa-Kong	LPG Spherical Tank and Facilities	S Apr. '18 F Jan. '20	EPC 210 M
Efficiency, Energy and Environment (3E) Project (CCR^HCU) Temporary Power	Bangchak Petroleum PCL. Hyundai Eng'g Co., Ltd. / Bangkok	Civil & Building Work	S Nov. '18 F May. '20	310 M
Efficiency, Energy and Environment (3E) Project (CCR^HCU) Temporary Power	Bangchak Petroleum PCL. Hyundai Eng'g Co., Ltd. / Bangkok	Temporary Power Work	S Nov. '18 F Dec. '18	10 M
PTTLNG Nong Fab LNG Receiving Terminal Project	PTT LNG / Saipem & CTCL / Map Ta Phut	Temporary Power Work	S Feb. '19 F Jun. '19	30 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Contract Amount
PTTLNG SOG Metering Project	PTT LNG Co., Ltd / Map Ta Phut	Civil, Structure, Equipment Erection and Piping Work	S Feb. '19 F Jun. '19	EPC 20 M
PTTLNG Grating	PTT LNG / Map Ta Phut	Grating Installation Work for PTT LNG Cold Water Facilities and PTT LNG IPG Project	S May. '19 F Oct. '19	5.8 M
PTTLNG Nong Fab LNG Receiving Terminal Project	PTT LNG / Saipem & CTCI / Map Ta Phut	Civil Work	S Jun. '19 F Mar. '21	643 M
PTTLNG Nong Fab LNG Receiving Terminal Project	PTT LNG / Saipem & CTCI / Map Ta Phut	UG Electric & Instrument Work	S Aug. '19 F Mar. '21	84 M

5. Project Experience



- TLAB PJT Build / Civil Work

Contract Amount : 313 Mil THB



- Substation BLDG
- FAR BLDG
- Recycle and Make Up Gas Compressor Shelter
- Recycle Compressor Shelter
- Air Compressor Shelter
- Chemical Injection Package Shelter
- Field Auxiliary Room Gantry Shelter
- NG Metering Station Shelter
- Expansion of Flow Computer Building
- **Work Period : May. '14 ~ Aug. '16**

Major Work Volume

- | | |
|--|--|
| • Excavation : 9,637 m ³ | • Masonry Work : 2,502 m ² |
| • Form Work : 14,921 m ² | • Painting Work : 8,200 m ² |
| • Rebar Work : 713 Tons | • Tile Work : 1,230 m ² |
| • Concrete Work : 5,523 m ³ | • Roofing Work : 2,082 m ² |
| • PVC Pipe Work : 9,000 m ³ | |



5. Project Experience

- TLAB PJT Structure Fab. & Erection / Platform & Ladder Fab.



Contract Amount : 313 Mil THB



Major Work Volume

Total : 1,400 Tons

- Pipe Rack(Unit 58300) : 720 Tons
- Pipe Rack(Unit 58200) : 670 Tons
- Shelter Structure : 500 Tons
- **Work Period : May. '14 ~ Aug. '16**

Sets of Platform/Ladder 36 sets for Column, Reactor and Vessel (Total : 305 Tons)

- Platform : 136 Tons
- Handrail & Ladder : 96 Tons
- Grating : 73 Tons
- **Work Period : Jun. '14 ~ Jan. '15**



5. Project Experience

- GSP#5 PJT WHRS Unit

Contract Amount : 31.1 Mil THB



Major Work Volume

Installation of Waste Heat Recovery

- Heater : Total 620 Tons
- Include Fuel Gas Skid, Blowers

Fabrication & Erection of Piping

- Total 3,000 DB

Painting Works

Work Period : May. '14 ~ Sep. '14



5. Project Experience

- KHAO BO YA LPG Terminal PJT E&I work



Contract Amount : 200 Mil THB

Major Work Volume

Total : 285,781 M

- Electrical : 310,000 M (Cable length)
- Instrument : 320,000 M (Cable length)
- Work Period : Sep. '14 ~ Jan. '16

Electrical

- Electrical Construction Management
- Supply labors, Consumables, equipment and tools for Construction Works
- Electrical Equipment Installation Works
- Cable Tray Works
- Lighting Fixture Installation Work
- Support Fabrication and Installation
- Cable Laying
- Cable Test and Termination
- Pre-Commissioning Work

Instrument

- Electrical Construction Management
- Supply labors, Consumables, equipment and tools for Construction Works
- Instrument System Installation Works
- Cable Tray Works
- Instrument Calibration Works
- Instrument Installation Works
- Support Fabrication and Installation
- Cable Laying
- Cable Test and Termination
- Pre-Commissioning Work



5. Project Experience

- TOP 202MW Small Power Producer PJT Building Package

Contract Amount : 197 Mil THB



- Substation 80
- Substation 81
- GTG Control BLDG 2EA
- STG Control BLDG 2EA

• **Work Period : Sep. '14 ~ Jan. '16**

Major Work Volume

- Pile Cutting : 471 ea
- Excavation : 1,014.00 m³
- Back Fill : 537.00 m³
- Rebar : 375.04 Tons
- Form Work : 19,050.50 m²
- Concrete Work : 2,181.00 m³
- Demolition Work : 175.09 m³
- Masonry Work : 4,288.50 m²



5. Project Experience - PTT LNG Receiving Terminal Expansion PJT Civil & STR. Work

Contract Amount : 382 Mil THB



- BOG Compressor Shelter
- HP LNG Shelter
- Send-Out Compressor Shelter
- BOG Operation Station
- Utility Station

• **Work Period : Nov. '14 ~ Mar. '16**

Major Work Volume

- Excavation : 16,852.98 m³
- Back Fill : 13,460.01 m³
- Concrete : 5,991.78 m³
- Rebar : 950.55 Tons
- Form Work : 21,324.44 m²
- Pile Head Cut : 611 ea
- Asphalt Paving : 493.90 m³
- Concrete Paving : 1,799.52 m³
- Demolition Work : 175.09 m³
- Painting Work : 2,924.96 m²

5. Project Experience - PTT LNG Receiving Terminal Expansion PJT Civil & STR. Work

Contract Amount : 382 Mil THB



Major Work Volume

STR. Work : Total 2,000 Tons

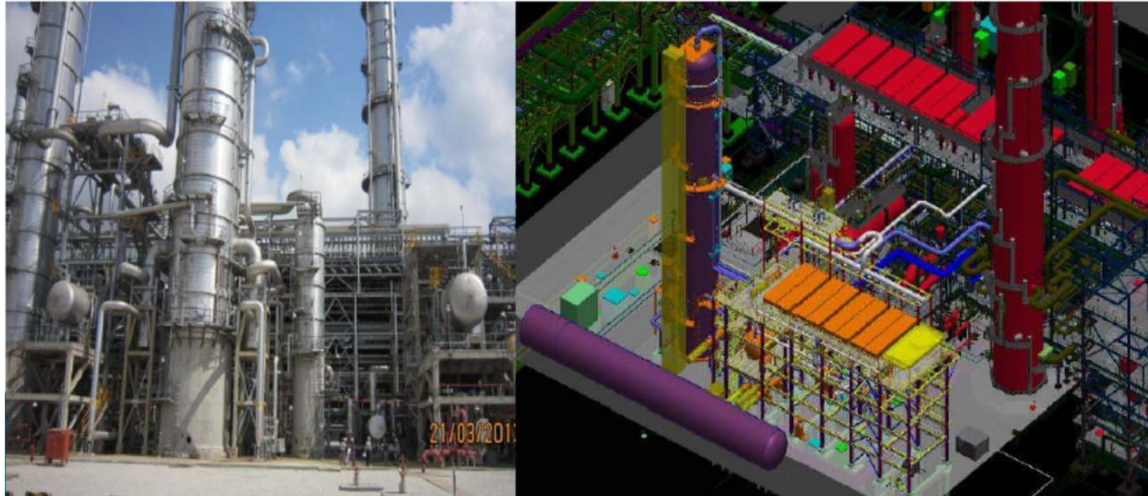
- Process Structure : 1,500 Tons
- Cable Tray Support : 500 Tons



5. Project Experience

- PTT GC Aromatic Debottlenecking PJT Piping Work

Contract Amount : 61.7 Mil THB



Major Work Volume

- Field Piping Work : 20,000 DB
 - Piping Support : 37 Tons
 - Field Painting
-
- Work Period : Apr. '15 ~ Oct. '15



5. Project Experience

- PTT ME Annapurna PJT STR Work

Contract Amount : 5.9 Mil THB



Major Work Volume

Total : 400 Tons

- Equipment Structure : 350 Tons
- Stair Tower : 40 Tons

• **Work Period : May. '15 ~ Jul. '15**



5. Project Experience

- PTT ASHAI SAR Emergency Vent Gas Project

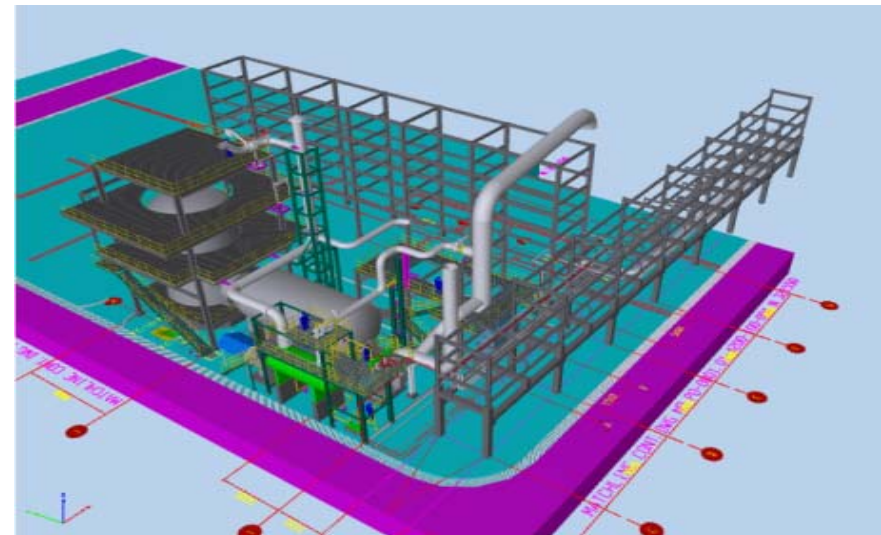
Contract Amount : 18.6 Mil THB



Major Work Volume

: Civil, Structure, Equipment Work, Piping, Painting & Insulation

- Work Period : Jul. '15 ~ Dec. '15



5. Project Experience

- TSE ATV Project

Contract Amount : 112.6 Mil THB



Major Work Volume

- Civil
 - Excavation : 4,361 M3
 - Concrete : 4,483 M3
 - Re-bar : 300 Ton
- Structure
 - Total Volume : 726 Ton
 - Steel Structure : 604 Ton
- Work Period : Feb. '16 ~ Apr. '16



5. Project Experience

- IRPC PPE Civil & Electric Work

Contract Amount : 83.4 Mil THB



Major Work Volume

Civil Work

- Excavation : 4,240 m³
- Form Work : 8,678 m²
- Rebar Work : 480 Tons
- Concrete Work : 2,458 m³

Electrical Work

- 12,000 M (Cable Length)
- Work Period : Feb. '16 ~ Dec. '16



5. Project Experience

- PTT Midline Compressor Station

Contract Amount : 507 Mil THB



General Contractor including commissioning service



Major Work Volume

- Structure : 800 tons for Equip. STR, Pipe Rack & Platform, Ladder
- Equipment Work :
 - Turbine compressor 4 sets
 - Fire fighting system
 - Air compressor, flare stack, Gas filter, Pig launcher & Receiver, Slop Oil Tank and Nitrogen Package & etc.
- Piping (110,000 DB)
 - Heavy wall (18"~ 46"), General piping
- Painting, Insulation
- Electric & Instrument Work
 - Electric Cable 120,000 M, Instrument Cable 140,000 M



5. Project Experience

- PTT Tank Terminal PP Spherical Tank and Facilities

Contract Amount : 345 Mil THB



Major Work Volume

- EPC Project for Propylene 4,000 ton Capacity Tank (10,000 m³, Dia 26.76 Meter, Erection Weight 1,482 ton, U2 Stamp), Transfer pump and Ground flare
- Civil, Tank Fab & Erection, Piping, Electric & Instrument Work



5. Project Experience



- PTT LNG Cold Water Facilities

Contract Amount : 733 Mil THB



Major Work Volume

- EPC Project for Cold Water Facilities (NG Heater, NG Vaporizer, Transfer Pumps, Tanks & F/F System)
- Civil, Structure, Piping, Electric & Instrument, Painting & Insulation Work



5. Project Experience

- PTT Wangnoi Compressor Station

Contract Amount : 378 Mil THB



Major Work Volume

- Civil, Steel Structure, Piping, Mechanical Work, Painting & Insulation Work
 - Civil : Concrete 11,000m³
 - Steel Structure : 610 Tons
 - Piping : 56,000 DB
 - Mechanical Work : GTG Compressors, Ground Flare, Gas & Lube Oil Coolers, Inlet filters, fire fighting pumps, Air compressor station, fuel Gas Skid



5. Project Experience

- PTT LNG IN-PLANT POWER GENERATION

Contract Amount : 167 Mil THB



MAJOR WORK VOLUME

ITEMS	UNIT	VOLUME
STRUCTURE	STEEL (TON)	317.8 Ton
MECHANICAL	EQUIPMENT (TON)	65 Sets /1,085.21 Ton
PIPING	PIPE (DB)	27,101 DI
PAINTING	AREA (M2)	1,974.43 M2
SCAFFOLDING	VOLUME (M3)	45,318 M3
CIVIL / BUILDING	VOLUME (M3)	3,003 M3



5. Project Experience

- PTT PO Civil



Contract Amount : 451 Mil THB
January 2018 – January 2020

Major Work Volume

- Civil Construction
 - Excavation : 89,050 m3
 - Concrete Work : 29,120 m3
 - Rebar Work : 2,025 Tons
 - Form Work : 55,350 m2



5. Project Experience



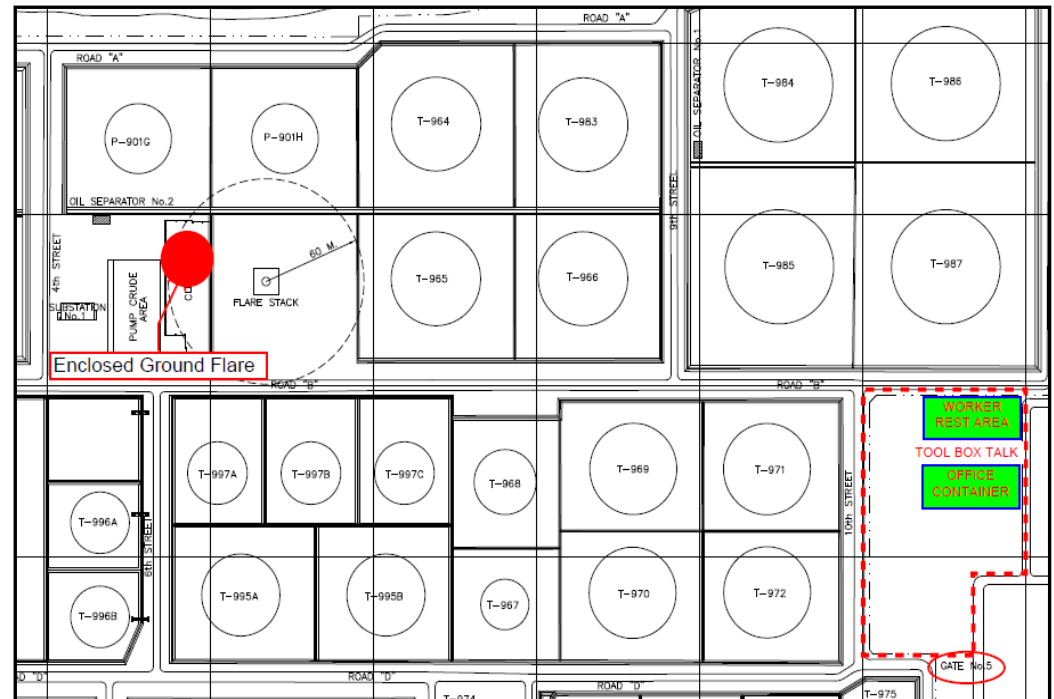
- Bangchak Enclosed Ground Flare (EGF)



Contract Amount : 272 Mil THB

April 2018 – August 2019

ITEMS	UNIT	VOLUME (CONTRACT)
CIVIL	CONCRETE (M3)	1,465.00
STRUCTURE	STEEL (TON)	63.00
PIPING	PIPE (DB)	11,000
ELECTRICAL	CABLE (M)	8,250.00
INSTRUMENT	CABLE (M)	16,400.00



5. Project Experience

- Bangchak CCR Civil

Efficiency, Energy and Environment (3E)
Improvement Project Phases II (CCR & HCU)

Contract Amount : 312 Mil THB
October 2018 – February 2020



ITEMS	UNIT	Civil	Arch.	Total
Excavation	m3	16,962	2,761	19,723
Form work	m2	12,089	3,286	15,375
Rebar work	ton	714	244	958
Concrete work	m3	8,008	2,052	10,060
Misc. Steel Work (Embed Steel)	ton	20	35	55
Demolition (Concrete)	m3	1,731	713	2,444
PC Installation (Main Frame)	Ea	9		9
Galv. Steel Sheet	m2		3,492	3,492
Steel Work	ton		48	48

5. Project Experience

- PTT GC OLEFINS RECONFIGURATION

ORP SMP PKG #2, #3, #4, #5

Contract Amount : 1,183 Mil THB

May 2018 – July 2020



ITEMS	UNIT	VOLUME (CONTRACT)
PIPING	PIPE (DB)	573,213
STRUCTURE	STEEL (TON)	5,171
EQUIPMENT	SET	539
PAINTING	M2	125,794



5. Project Experience

- PTT GC ORP STR Fab.

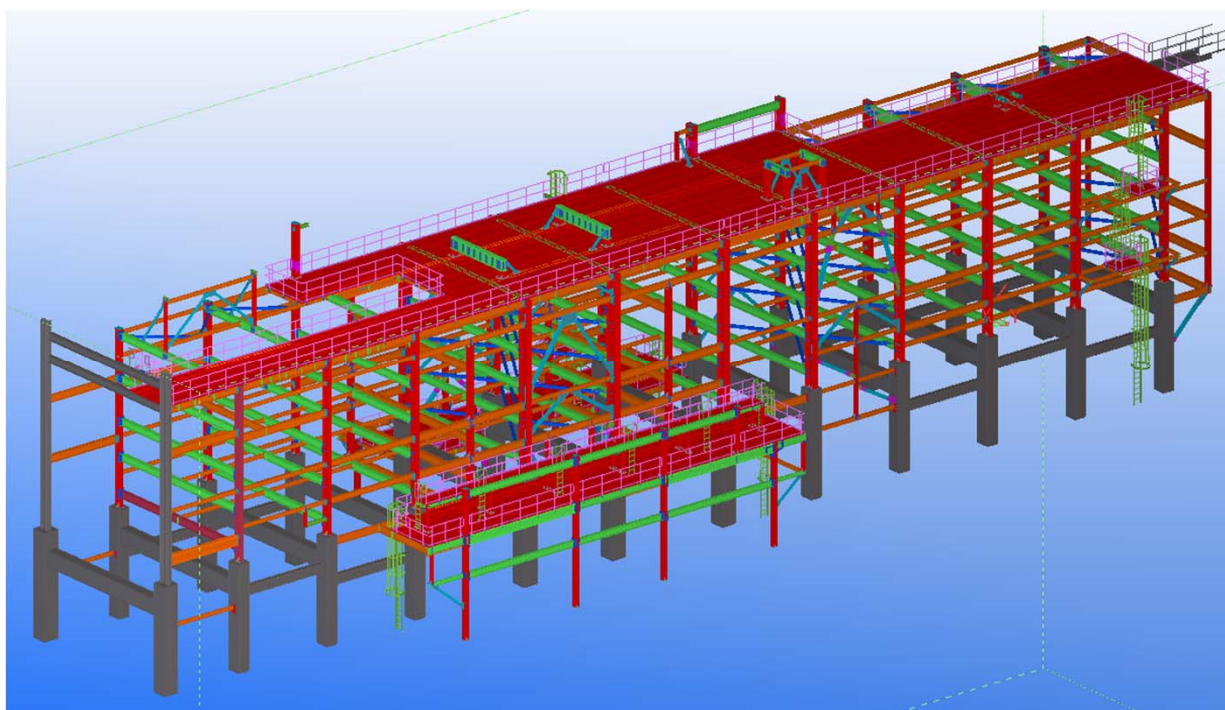


Contract Amount : 297 Mil THB

April 2018 – August 2019

MAJOR WORK VOLUME

ITEMS	UNIT	VOLUME
STRUCTURE (Fabrication)	TON	6,105.1 Ton
STRUCTURE (Paint)	M2	140,185.3 m2



5. Project Experience

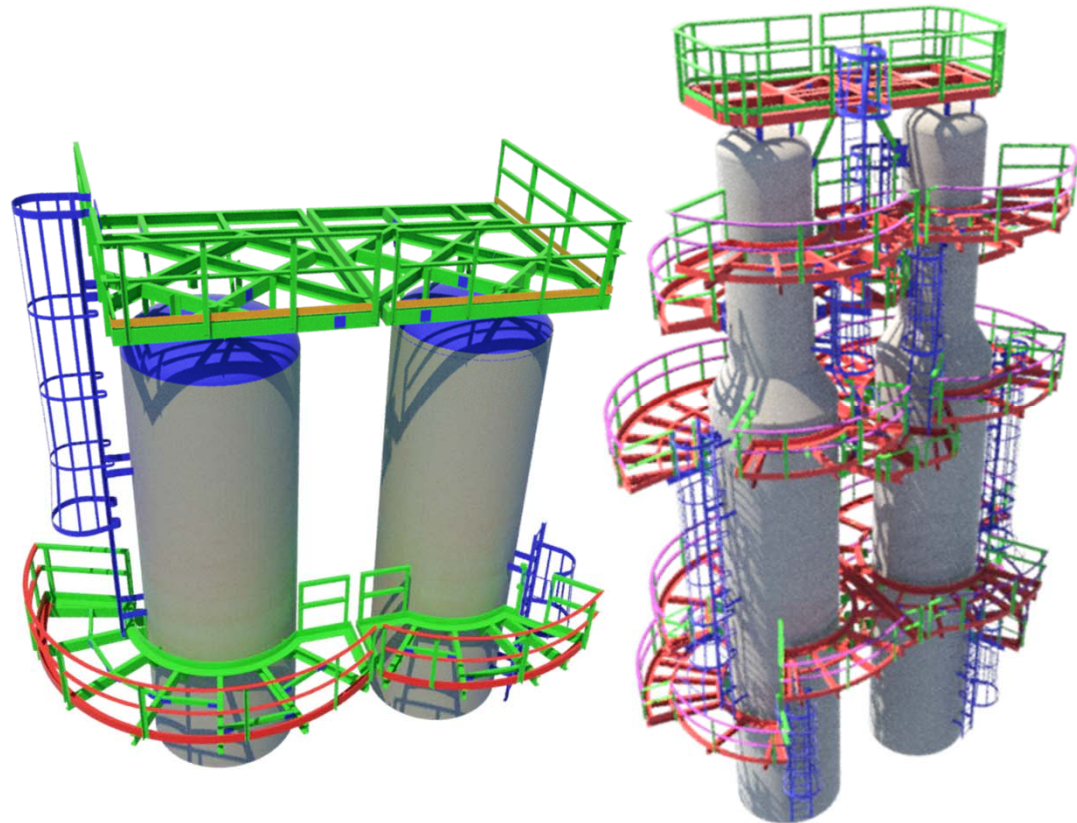
- PTT GC ORP Platform & Ladder Fab.



Contract Amount : 90 Mil THB
September 2018 – August 2019

MAJOR WORK VOLUME

ITEMS	UNIT	VOLUME
STRUCTURE (Fabrication)	TON	884 Ton
STRUCTURE (Paint)	M2	About 28,935.9 m2



Execution

Capacity of each Disciplines

6-1

Execution
Capacity



Civil & Building Discipline



6-1. Execution Capacity of Civil & Building Discipline



Manpower Mob. Capability : 1,100 Workers (Current 700 Workers)

Civil Work

- Piling (Bored / Driven / Non-Pollution Pile)
- Equipment Foundation
- Tank Foundation (Concrete Type)
- Tank Foundation (Earth Type)
- Pre-Casting Concrete Pipe Rack
- Concrete Fire Proofing
- Water Storage Pond & Pit
- Concrete Dike & Earth Bund-wall
- U/G Drainage Manhole & Box
- Trench & U-Ditch with Grating Cover
- Pipe Support & Pipe Sleeper
- Cooling Tower (4 Cell Basin & Con'c structure)

Building Work

- Central Control Building
- Pelletizing Building
- Compressor Building
- Sub-Station Building

6-1. Team Experience for Civil & Building



Year	Project Name	Volume
2013	Thai Oil EIPSA3 Project	Concrete : 5,500 m ³
2013	PTT SAIYOK Compressor Station 4 Project	Concrete : 1,350 m ³
2013	BangChak TGTU Project	Concrete : 1,020 m ³
2012	PTT Onshore Compressor Station #4 Project	Concrete : 15,020 m ³
2011	BST NB Latex Project	Concrete : 9,200 m ³
2010	PTT Tank Terminal Project	Concrete : 14,700 m ³
2009	PTT Chem EPS Power Plant	Concrete : 13,010 m ³
2009	PTTAR Clean Fuel Project	Concrete : 11,160 m ³
2008	PTT FRT Tank Project	Concrete : 1,520 m ³
2008	SCG THPP #3 Project	Concrete : 21,300 m ³
2008	MOC ARU Project	Concrete : 10,100 m ³
2008	PTT Chem Furnace, EOT & GHU Project	Concrete : 410 m ³
2008	PTT Chem Diversion Pit Project	Concrete : 990 m ³
2007	PTTAR Complex #2 Project	Concrete : 6,900 m ³
2007	PTTAR Diesel Tank Project	Concrete : 2,700 m ³
2006	PTTAR Condensate Tank Project	Concrete : 11,300 m ³

6-2

Execution
Capacity



Structure Discipline



6-2. Execution Capacity of “Structure Discipline”



Major Work

- Pipe rack, Equipment Structure & Shelter Structure Work
- Furnace & Heater Fabrication Work
- Platform & Ladder Fabrication Work
- Flare Stack Fabrication Work

Structure Production Capability : 30~40 ton/Day

Manpower Mob. Capability

- Total 500 Workers (Current 190 Workers)



6-2. Execution Capacity of “Structure Discipline”



- Automation Line for Structure Fab.



Laser Cutting & Drilling M/C



CNC Plate Cut M/C 3 sets



CNC Plate Drill M/C



CNC Shape Steel Drill M/C 2 sets



Band Saw 4 sets



CNC Scallop & Bevel M/C



Shape Steel Roll M/C



CO2 FCAW Welding M/C 120 sets



Fit up & Welding

6-2. Team Experience for Structure



Year	Project Name	Volume
2013	PTT GSP5 PJT	400 tons
2013	PTT Saiyok compressor Station Unit 4 PJT	350 tons
2012	BANGCHAK TGTU PJT	850 tons
2011	PTT Onshore compressor Station 4 PJT	1600 tons
2011	BST NB Latex PJT	1350 tons
2010	PTT Tank Terminal PJT	350 tons
2009	PTTAR Clean Fuel PJT	1,800 tons
2008	MOC Furnace Cracker PJT	9,800 tons
2008	SCG THPP #3 PJT	2,800 tons
2008	MOC ARU PJT	600 tons
2008	RRC Upgrading	1,600 tons
2007	PTT Chem Furnace	600 tons
2007	PTTAR Complex #2 PJT	450 tons
2006	ATC FRC Project	340 tons

6-3

Execution
Capacity



Piping Discipline



6-3. Execution Capacity of “Piping Discipline”



General Welding

- Carbon Steel Pipe
- A333 Gr. 1 & 6
- A335 P11 & P22/P91
- A312 TP304/304L, A312 TP316/316L
- A312 TP321H, A312 TP347H

Special Welding

- Carbon Steel Pipe
- KHR32C (Kubota Steel)
- 35Cr-45Ni
- 25Cr-35Ni
- 20Cr-32Ni

Piping Work Capability

- Shop Fabrication Work : 2000 DB/Day
- Field Erection Work : 2000 DB/Day

Manpower Mob. Capability

- Welders : 300 workers (Current 70 workers)
- Workers : 1200 workers (Current 240 workers)

Dissimilar Welding

- A351-CF8C + SA 312 TP321H
- SA 312 TP321H + A335 Gr.P22
- KHR32C + Alloy 800H
- 35Cr-45Ni + 25Cr-35Ni
- SA 312 TP321H + 25Cr-35Ni
- 35Cr-45Ni + 20Cr-32Ni
- GX10NiCrNb3220 + 20Cr-32Ni
- 20Cr-10NiCb + SA 312 TP321H,347H

6-3. Execution Capacity of “Piping Discipline”



- Automation for Piping Fab.



Piping Cutting/ Beveling
MC : 12"~46" (5 sets)



Piping Fit up MC : 18"~46"



Piping Auto Welding MC
: 18"~46" (7 sets)



Hydraulic Bolt Torque MC
(5 sets)

6-3. Team Experience for Piping



Year	Project Name	Volume
2017	PTT Wangnoi Compressor Station	56,000 DB
2017	PTT LNG Cold Water Facilities Project	51,000 DB
2017	PTT Tank Propylene Tank Facilities Project	12,000 DB
2016	PTT Midline Compressor Station Project	124,000 DB
2015	PTT GC Debottlenecking Project	22,000 DB (Field Only)
2013	PTT GSP5 PJT	42,000 DB
2013	PTT Saiyok compressor Station Unit 4 PJT	22,000 DB
2012	BANGCHAK TGTU PJT	38,000 DB
2011	PTT Onshore compressor Station 4 PJT	48,000 DB
2011	BST NB Latex PJT	90,000 DB
2010	PTT Tank Terminal Project	128,000 DB
2009	PTTAR Clean Fuel Project	180,000 DB
2009	PTT Chem. Power Plan	86,000 DB
2009	DOW Offsite Pipeline Project	120,000 DB
2008	MOC ARU Project	196,000 DB
2008	THPP#3	195,000 DB
2008	MOC Furnace Cracker Unit	65,000 DB

Total 1,000,000 DB for 2 year

6-3. Team Experience for Piping



Year	Project Name	Volume
2007	PTTAR Complex #2 Project	98,000 DB
2007	ROC Furnace Q Project	20,000 DB
2006	ATC FRC Project	55,000 DB
2005	ROC M4 Project	28,000 DB
2004	ATC Debottlenecking Stage 2 Project	45,000 DB

6-4

Execution
Capacity



Equipment Discipline



6-5. Execution Capacity of Equipment



Equipment Shut Down Work

- Replacement of Air Fan Cooler
- Re-tray work (UOP 3 to 4 tray, Packing tray & etc.)
- Heater Modification Work
(Burner replacement, Radiant Coil replacement Work)
- Heat Exchanger & Bundle Replacement Work
- Pump Modification Work
(Impeller, Motor, Pump replacement)

Special Equipment Work

- Reciprocating Compressor, Centrifugal Compressor Installation work
- Heater, Furnace Installation Work
- Rotating Pump Installation Work
- Cooling Tower, Clarifier Installation Work
- Air Fan Cooler assembly and Installation Work

Manpower Mob. Capability

- Workers : 400 workers

6-4. Team Experience for Equipment



Year	Project Name	Volume
2013	PTT GSP 5 PJT	29 sets / 620 tons
2013	PTT Saiyok compressor Station Unit 4 PJT	10 sets / 350 tons
2012	BANGCHAK TGTU PJT	45 sets / 1,130 tons
2011	PTT Onshore compressor Station 4 PJT	50 sets / 930 tons
2011	BST NB Latex PJT	483 sets / 10,075 tons
2010	PTT Tank Terminal PJT	70 sets / 2,470 tons
2009	PTTAR Clean Fuel PJT	90 sets / 3,558 tons
2008	SCG THPP #3 PJT	12 sets / 1,080 tons
2008	MOC ARU PJT	10 sets / 1,200 tons
2008	MOC Furnace Cracker Unit	48 sets / 4,300 tons
2007	PTTAR Complex #2 PJT	4 sets / 320 tons
2007	ROC Furnace Q	1 sets / 20 tons
2006	ATC FRC Project	4 sets / 340 tons
2005	ROC M4 PJT	20 sets / 450 tons
2004	ATC Bottlenecking Stage 2	11 sets / 920 tons

6-5

Execution
Capacity



Electrical & Instrument Discipline



6-5. Execution Capacity of Electrical & Instrument



Electrical Work

- Motor Solo Run Test
- Grounding / Cathodic Work & Testing
- Cable Tray & Conduit Work
- Electrical Equipment Installation
- SWGR / MCC Trouble Shooting



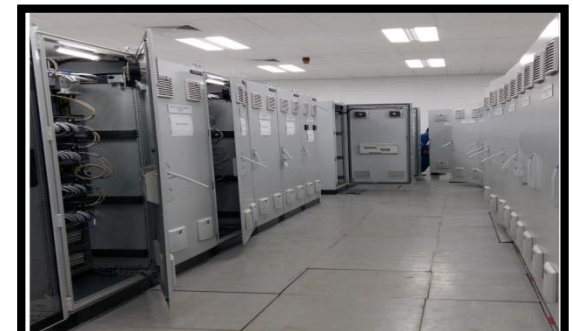
E&I Work Capability

- Instruments Calibration & Loop Testing
- Electrical Installation; i.e. HV & LV SWGR, MCC, TR, cabling work, etc., Motor Solo Run Testing



Manpower Mob. Capability

- 700 Manpower (Currently 350 Manpower)



6-5. Team Experience for Electrical & Instrument



Year	Project Name	Volume
2013	PTT OCS4 Project	Cable : 164,000 m
2012	BST NB Latex Project	Cable : 190,000 m
2010	PTT Tank Terminal Project	Cable : 197,000 m
2009	PTTAR Clean Fuel Project	Cable : 227,523 m
2009	SCG THPP #3 Project	Cable : 368,380 m
2008	MOC ARU Project	Cable : 219,410 m
2008	MOC Furnace Cracker Unit	Cable : 18,410 m
2007	PTTAR Complex #2 Project	Cable : 202,758 m
2007	ROC Furnace Q Project	Cable : 48,451 m
2006	ATC FRC Project	Cable : 12,941 m
2005	MOC M4 Project	Cable : 6,478 m
2004	ATC Debottlenecking Stage 2 Project	Cable : 46,785 m

6-6

Execution
Capacity



Painting & Scaffolding Discipline



6-6. Execution Capacity of Painting & Scaffolding



Metal Grid Blasting Work

- 600 m²/ Day

Pipe Blasting Machine (1"~ 32")

- 1,000 m²/ Day

Painting Manpower Mob. Capability

- Total 150 Painters

Scaffolding Manpower Mob. Capability

- Total 150 Workers



6-7

Execution
Capacity



EPC & Genecon Project Experience



6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
ROC M4 Phase II	Rayong Olefins Co., Ltd. / Map Ta Phut	• EPC Lump sum work for Turn around 2005 of Olefin Plant (45 days)	S Nov. '05 F Dec. '05	LSTK 2.7 M
TPI Crude Facilities System Project	Thai Petrochemical Industry Public Co., Ltd. / Rayong	• EPC Lump Sum Work for Crude Piping Modification Work	S Jul. '05 F Jun. '06	LSTK 2.6 M
ROC Furnace Q Project	Rayong Olefins Co., Ltd. / Map Ta Phut	• EPC Lump sum work for Ethylene Cracking Furnace (EPC Consortium with ABB (Licensor))	S Sep. '05 F Mar. '07	LSTK 11.0 M
Plant 2 Bottleneck Project Cracking Furnace Unit	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• EPC Lump Sum for Cracking Furnace Unit (EPC Consortium with Linde)	S Dec. '06 F Nov. '08	LSTK 7.8 M
RRC Condensate and Drain Tanks Design and Construction	Rayong Refinery (Public) Co., Ltd. / Map Ta Phut	• Design and Construction Lump Sum for Civil Work for 3 Condensate Tanks and 2 Drain Tanks including Bund wall and Drainage System	S Dec. '06 F Feb. '08	LSTK 8.4 M

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
RRC Condensate and Drain Tanks Phase 3	Rayong Refinery (Public) Co., Ltd. / Map Ta Phut	• Construction Lump Sum for Civil, Structure, Piping & Equipment, E&I Work	S Sep. '07 F Feb. '08	LSTK 4.3 M
PTT Chem GHU Spare Reactor	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• EPC Lump Sum for Spare 2 Reactor	S Sep. '06 F Jan. '09	LSTK 4.5 M
Ethylene Off Spec. Tank	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• EPC Lump Sum for Ethylene Off Spec. Tank System	S Sep. '07 F Aug. '08	LSTK 4.2 M
THPP #3 Project	Thai Polypropylene Co., Ltd. / Map Ta Phut	• Construction Lump Sum (Consortium with SKEC) (Largest PP plant in the World)	S Oct. '07 F Oct. '09	LSTK 28.3 M
MOC Aromatic Recovery Unit	MOC / Map Ta Phut	• Construction Lump Sum (Consortium with HEC)	S Oct. '07 F Oct. '08	LSTK 19.5 M

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
PTT Sriracha Terminal Expansion Project (IFRT Tank)	PTT Public Co., Ltd. / Sriracha	• EPC Lump Sum for FRT Tank (Capacity: 70,000 m ³ X 1 set)	S Oct. '08 F Sep. '09	LSTK 11.2 M
PSA Unit Project	PTT AR (Public) Co., Ltd. & SKEC / Map Ta Phut	• Construction Lump Sum for Civil, Structure, Mechanical, Piping and E&I Work	S Dec. '08 F Sep. '09	LSTK 3.1 M
PTT Chem EPS Power Plant Project	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• 114 MW Cogeneration Power Plant Construction for Civil/Building, Mechanical, Piping and Paint/Insulation Work	S Jan. '09 F Sep. '10	LSTK 14.4 M
Thai Growth Project Field Erected Tank	DOW Chemical Co., Ltd. & AIE / Rayong	• EPC Lump Sum for Field Erected Tanks for TPO, PUI and SE Plant (9 sets)	S Mar. '09 F Mar. '10	LSTK 3.6 M
PTT Tank Terminal Project	PTT Tank Terminal Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Consortium with SKEC) for Tankage and Jetty Facilities	S Mar. '10 F Mar. '11	LSTK 67.1 M
BST NB Latex Project	Bangkok Synthetics Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Single contract PJT for EPC.)	S Dec. '10 F Jun. '12	LSTK 53.0 M

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

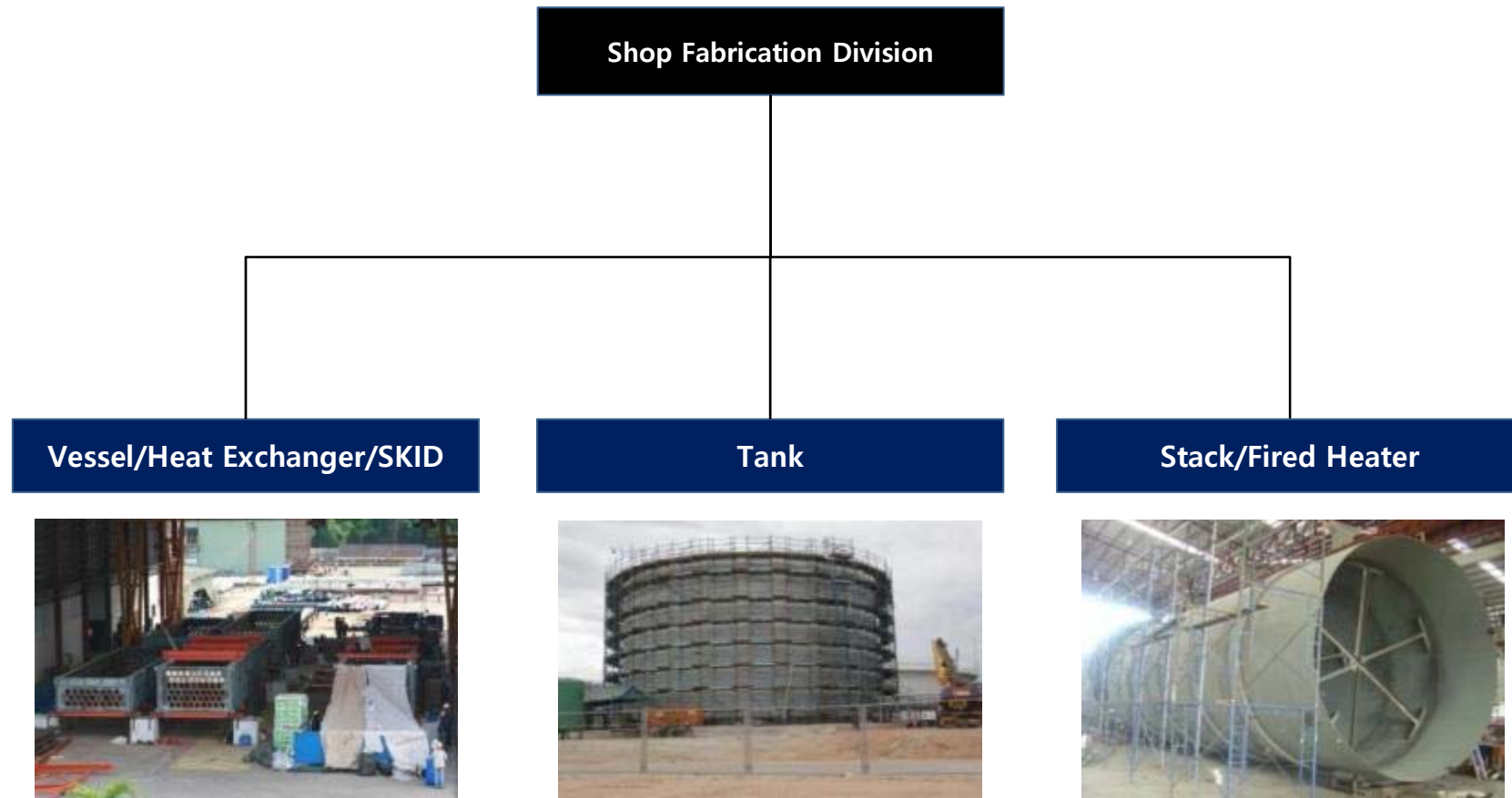
Project	Client / Location	Description	Period	Remark
Onshore Compressor Station 4 Project	PTT Public Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Consortium with SKEC)	S Mar '11 F Feb. '13	LSTK 67.0 M
DOW Propylene Glycol (PG) Project	DOW Chemical Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Single contract PJT for EPC.)	S Jun. '11 F Jun. '12	LSTK 0.92 M
Environmental Improvement Project(TGTU)	Bangchak Petroleum (Public) Co., Ltd / Bangkok	• EPC Lump Sum (Single contract PJT for EPC.)	S May '10 F Mar. '11	LSTK 29.0 M
Saiyok Compressor Station unit 4	PTT Public Co., Ltd. /Kanchanaburi	• EPC Lump Sum	S June'12 F June'14	LSTK 28.0 M

7

Shop



Shop Fab. Division



1. Fabrication Items

Pressure Vessel, Heat Exchanger, Column & Tower

2. Capability

- 1) Thickness : Max. 50 m/m
- 2) Handling Weight : Max. 100 Ton/unit
- 3) Handling Length : Max. 35 m
- 4) Max Capability : 200 Tons / Month (Pressure Vessel)

3. Material

- 1) Carbon Steel : A36/A283,5/A516/A537
- 2) Stainless Steel : A312 TP304(L)/316(L)/310(H)/321(H)/347(H)
- 3) Alloy Steel : A387/Kubota Steel
- 4) CLAD Material : SS+CS



7-1

Execution
Capacity

Pressure Vessel / Heat Exchanger / Column / Tower



- CNC Cutting



- Auto Welding



- Head Forming



- Heat Exchanger



7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
PTT OCS#4 Project (PTT Public Co.,Ltd.)	Flar Blow Down Drum	Horizontal	ID3500 x 12000TL x 21t	SA516-60N+S5	2012	Stamp "U"
	Slop Tank	Horizontal	ID3000 x 12000TL x 13t	SA516-60N+S5	2012	Stamp "U"
	Instrument Air Receiver	Vertical	ID3600 x 10000TL x 20t	SA240-304	2012	Stamp "U"
	Utility Air Accumulator	Vertical	ID1500 x 4000TL x 11t	SA516-70	2012	Stamp "U"
	Desel Oil Tank	Horizontal	ID1800 x 5000TL x 9t	A283-C	2012	Stamp "U"
Bayer Public Co.,Ltd.	Vacuum package	BEM	ID400 x 2500L x 12t	A240-316Ti/A312-TP316Ti	2012	Stamp "U"
	Spare Charge heater	BEU	ID1020 x 3782TL x 14t	A516-60N/A179	2012	Stamp "U"
	Vent Cooler	BEU	ID389 x 3800TL x 11t	A516-60N/A179	2012	Stamp "U"
BCP TGTU Project (The Bangchak Petroleum Public Co.,Ltd.)	Quench Column	Column	ID1600 x 14700TL x 9t	A240-316L	2012	
	Absorber	Column	ID1200 x 15800TL x 13t	A516-60N	2012	
	Regenerator	Column	ID1100 x 19350TL x 11t	A516-60N/A240-316L	2012	
	Hydrogeneration Reactor	Horizontal	ID2100 x 3800TL x 13t	A516-60N	2012	
	Tail Gas Preheater	BEU	ID1020 x 3782TL x 14t	A516-60N/A179	2012	
	Tail Gas Heater A	BEU	ID1016 x 5998TL x 13t	A516-60N/A179	2012	
	Tail Gas Heater B	BEU	ID1016 x 5998TL x 13t	A516-60N/A179	2012	
	Recycle Gas Preheater	BEU	ID489 x 3800TL x 11t	A516-60N/A179	2012	
	Reboiler	BKU	ID1550 x 5657TL x 10t	A240-316L/A312-TP316L	2012	
PTTGC 2 and 3 Project	AC Filter A	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	AC Filter B	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	AC Filter C	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	Absorber Column V63	Vertical	ID970 x 3315TL x 15t	A516-60	2012	
	Absorber Column V4	Vertical	ID970 x 3315TL x 15t	A516-60	2012	

7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
BST NB Latex Project Pressure Vessel New Fabrication (Bangkok Synthetics Co.,Ltd)	PMHP Tank	Vertical	OD762 x 1219H	A240-316L	2011	
	Reducer Tank	Vertical	OD1270 x 1829H	A240-316	2011	
	Initial Charge Tank A	Vertical	OD2133.6 x 5181.6H	A240-316	2011	
	Initial Charge Tank B	Vertical	OD2438 x 3352.8H	A240-316L	2011	
	Aqueous Feed Tank Train A	Vertical	OD1524 x 3080H	A240-316	2011	
	Catalyst Feed Tank Train A	Vertical	OD1524 x 3080H	A240-316	2011	
	Aqueous Feed Tank Train B	Vertical	OD1524 x 3080H	A240-316	2011	
	Catalyst Feed Tank Train B	Vertical	OD1524 x 3080H	A240-316	2011	
	Aqueous Feed Tank Train C	Vertical	OD1524 x 1981.2H	A240-316	2011	
	Catalyst Feed Tank Train C	Vertical	OD1676.4 x 2606.8	A240-316	2011	
	FeSO ₄ Premix Tank A	Vertical	ID500 x 750H	A240-316L	2011	
	Persulfate Catalyst Premix Tank	Vertical	OD1372.6 x 406.4H	A240-316	2011	
	White Water Tank AB	Vertical	OD3657.6 x 6096H	A240-304	2011	
	Intermediate Latex Tank A	Vertical	OD3660 x 11000H	A240-304	2011	
	Intermediate Latex Tank B	Vertical	OD3650 x 9470H	A240-304	2011	
BST NB Latex Project Heat Exchanger (Bangkok Synthetics Co.,Ltd)	Stripper Jacket Heater Train C	BEM	OD8" Pipe x 2297.2L	A106-B , A240-304L	2011	
	AN Scrubber Water Cooler	H-Double Pipe	400W x 5305.7L x 1500H	A106-B	2011	
	First BD Condenser	BEM	ID450 x 5039L	A516-70	2011	
	Deaerator Water Cooler	BEM	ID700 x 7920L	A516-70	2011	
	Hot Water Heater	BEM	OD8" Pipe x 2527.2L	A106-B	2011	
	First BD Condenser	BEM	OD8" Pipe x 3033L	A106-B	2011	
	AN Recycle Cooler	H-Double Pipe	400W x 5305.7L x 1500H	A312-304 , A106-B	2011	
	Vent Condenser	BEM	OD16" Pipe x 3264.8L	A106-B	2011	
	Vent Condenser	BEU	OD10" Pipe x 2209L	A106-B	2011	
	Reactor Jacket Heater Train CDEF	BEM	OD12" Pipe x 2228.8L	A106-B , A240-304	2011	
	Initial Charge Heater AB	BEM	OD10" Pipe x 2448L	A106-B , A240-316L	2011	
	Dodecyl Benzene Sulfonic (DDBSA) Tank Heater	H-Double Pipe	400W x 4011.3L x 1900H	A312-316 , A106-B	2011	
	MAA Cooler	BEM	OD16" Pipe x 2002.8L	A106-B , A312-316L	2011	
	Stripper Overhead Condenser Train AB	BEM	Shell ID1044 x 5156.2H	S/T=CS , Tube=304SS	2011	

7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
BST NB Latex Project Pressure Vessel Fabrication (Bangkok Synthetics Co.,Ltd)	Screener Collection Tank Train A/B/C	Vertical	ID762 x 915TL	A516-70 + Teflon Coating	2011	
	Condensate Flush Drum	Vertical	ID1000 x 3200TL	A516-70	2011	
	Process Air Receiver Drum	Vertical	ID2800 x 6500TL	A516-70	2011	
	Instrument Air Receiver Drum	Vertical	ID3200 x 10000TL	A516-70	2011	
	Flare K.O. and Blow Down Drum	Horizontal	ID3400 x 7000TL	A516-70	2011	
	Recovered an Storage Tank	Horizontal	ID2200 x 3850TL	A516-70	2011	
	Na2SO3 Hopper	Vertical	920W x 920L x 810H	A240-316L	2011	
	Bruggoglite Bag Dump Hood	Vertical	900W x 910L x 810H	A240-316L	2011	
	O2 Scavenger Bag Dump Hood	Vertical	500W x 500L x 510H	A240-316	2011	
	Compound Tank B/C	Vertical	ID3048 x 5182TL	A240-304L	2011	
	Emergency Killing Agent Tank	Vertical	ID700 x 1050TL	A240-304	2011	
	Hot Water Drum	Vertical	ID750 x 2100TL	A516-70	2011	
	Compound Tank Train A	Vertical	OD3657.6 x 6832.6H	CS + Glass lined	2011	
	Blowdown Tank Train A/B	Vertical	ID3810 x 6769.1H	CS + Glass lined	2011	
	Blowdown Tank Train C	Vertical	ID3810 x 6807.2H	CS + Glass lined	2011	
	Stripper Train A	Vertical	ID3658/3810 x 4744H	CS + Glass lined	2011	
	Stripper Train B	Vertical	ID3658/3810 x 4744H	CS + Glass lined	2011	
	Stripper Train C	Vertical	ID3658/3810 x 4673.6H	CS + Glass lined	2011	
	Reactor Train A	Vertical	ID2590.8 x 4673.6H	CS + Glass lined	2011	
	Reactor Train B	Vertical	ID2590.8 x 4673.6H	CS + Glass lined	2011	
	Reactor Train C	Vertical	ID2600/2700 x 5247.9H	CS + Glass lined	2011	
	Scrubber Solution Prep Tank	Vertical	OD1371.6 x 1660H	A240-316L	2011	
	AN Storage Tank	Saddle	ID3048 x 9067.8L	A240-304L	2011	
	TDDM Day Tank	Vertical	OD3048 x 4877H	A240-304L	2011	
	PTZ Solution Charge Tank	Vertical	ID600 x 610H	A240-304	2011	
	DDBSA Storage Tank	Vertical	OD2895.6 x 6705.6H	A240-316	2011	
	Caustic Tank	Vertical	OD2743.2 x 7426H	A240-304	2011	
	NH4OH Tank	Vertical	OD3200 x 6000H	A240-316	2011	
	Chainguard Tank	Vertical	ID1270 x 2600H	A240-316L	2011	

7-2

Execution
Capacity

Tank Fabrication / Erection



- FRT Tank



PTT Tank Sriracha



- DRT / CRT Tank



Dow Chemical



PTT Chemical

7-2. Execution Capacity of Tank Fabrication / Erection



- DRT / CRT Tank



PTT Tank Terminal



PTT LNG Tank Terminal

7-2. Execution Capacity of Tank Fabrication / Erection



- Spherical Tank



Press 1500 tons



Plate cutting



PTT Tank Terminal PP Tank



PTT LPG Tank / Khaoboya



PTT Tank Terminal PP Tank

7-2. CAZ Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
PTT Tank Terminal	PTT Tank Terminal / Map Ta Phut	4,000 Ton Propylene Spherical Tank (U2 Stamp) and Facilities (EPC Project)	S Dec. 16 F Aug. 18	
PTT LNG Terminal	PTT LNG	Warm and Cold Water Tanks (CRT)	S Jul. 17 F Feb 18	

7-2. Team Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
SAKC Expansion PJT	SAK CHASIDHI / Map Ta Phut	Expansion Storage Tank 11ea	S Oct. 13 F Mar. 15	
KhaoBoYa LNG Tank PJT	PTT (Public) Co., Ltd / Sriracha	EPC Lump Sum for LPG Tank (3,000 Tons, 2 Sets)	S Oct. 13 F Feb. 15	
JAC Storage Tank PJT	JAC / Singapore	JAC C1 Storage Tank 22 Sets	S Jul. 12 F Mar. 13	
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map Ta Phut	EPC Lump Sump Contract for Tank Terminal 1 Spherical Tank	S Jul. 10 F May. 11	
OCS#4 Project	PTT Public Co.,Ltd. / Map Ta Phut	EPC Lump Sump Contract for Field Erection Tanks for OCS#4 (2 Tanks)	S April 12 F Sep. 12	
Thai Growth Project Field Fab. Tank Project	DOW Chemical Co., Ltd. & AIE / Rayong	EPC Lump Sump Contract for Field Erection Tanks for PG (6 Tanks)	S June. 11 F Apr. 12	
PTTAR Biodiesel Tank	PTT AR (Public) Co., Ltd. / Map Ta Phut	Bio-Diesel Tank Fabrication / Erection (2 Tank)	S Feb. 11 F Nov. 11	
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map Ta Phut	EPC Lump Sum for Propylene Sphere Tank (3000 Tons)	S Oct. 10 F July. 11	

7-2. Team Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map Ta Phut	EPC Lump Sum Contract for Tank Terminal including 8 CRT tanks	S May. 10 F Apr. 11	
MOC Aromatic Recovery Unit	MOC / Map Ta Phut	Construction Lump Sum & Solvent Tank Fab. / Erection	S Oct. 07 F Dec. 09	
PTT CHEM EPS POWER PLANT	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	114 MW Cogeneration Power Plant Construction & Tank Fabrication/Erection (5 Tank)	S Jan. 09 F Sep. 10	
PTT Sriracha Terminal Expansion Project (FRT Tank)	PTT Public Co., Ltd. / Sriracha	EPC Lump Sum for FRT Tank (Capa. 70,000 m ³ x 1 set)	S Oct. 08 F Sep. 09	

7-3

Execution
Capacity

Fired Heater, Stack(steel/flare), SKID Unit



7-3

Execution
Capacity

Fired Heater, Stack(steel/flare), SKID Unit



7-3

Execution
Capacity

Heater Modularization Work



7-3. Team Experience for Fired Heater, Stack(steel/flare), SKID Unit



Project	Owner/Client/Location	Description	Period	Remark
PTT GSP5 WHRU Project	PTTGC / E-Tech / Thailand	WHRU - Coil material A335P11/P22 (Pin tube Type)	S Dec. '13 F Jun. '14	F / 3.3 M
Aramco Project	Aramco / KTI / Saudi Arabia	Steel work - Radiant / Convection / Stack	S Dec. '13 F May. '14	F / 1.8 M
CILACAP Project	GSEC / Linde / Indonesia	Fired Heater (2 Sets, 430 tons) - Coil material A335P11/P22/TP304H/321H	S Aug. '13 F Feb. '14	F / 1.8 M
UHV Project	IRPC / ITT / Thailand	Fired Heater (4 Sets, 400 tons) - Coil material A335P11/P22	S Oct. '13 F Mar. '14	F / 1.4 M
SAMUR Project	PETRONAS / ITT / Malaysia	Reformer (1 Set, 1,150 tons) - Coil material A335P11/P22/TP304H/321H	S Jul. '12 F Mar. '13	F / 40.0 M
West Qurma II Project	SECL / ITT / IRAQ	Hot oil heater (8 Sets, 880 tons with Modularization) - Coil material A106B	S Jul. '12 F Dec. '12	F / 2.2 M
Algiers Refinery Project	AADR / ITT / Algeria	Atmospheric & Fired Heater (6 Sets, 1,780 Tons) - Coil material A335P5/P9/P11/P22	S Mar. '12 F Nov. '12	F / 30.0 M
South Par Project	NIOC / ITT / Iran	Fired heater (6 Sets, 256 tons) - Coil material A106B	S Feb. '12 F Aug. '12	F / 0.8 M

7-3. Team Experience for Fired Heater, Stack(steel/flare), SKID Unit



Project	Owner/Client/Location	Description	Period	Remark
RMP Project	Petron Bataan / ITT / Philippines	Fired heater (2 Sets, 515 tons with Modularization) - Coil material A335P9/P11/TP347H	S Mar. '12 F Oct. '12	F / 1.2 M
JAC Project	SKEC / ITT /Singapore	Reformer & Charge heater & Re-boiler (13 Sets, 7,800 Tons with Modularization) - Coil material A335P9/P11/P22/TP304H/TP321H/TP347H	S Jan. '12 F Oct '12	FME / 26.0 M
Tianjin China Project	TBCO / ITT / China	Reactor charge heater (1 Set, 880 Tons) - Coil material A335P11/TP321/TP347	S Oct. '11 F Jun. '12	F / 2.0 M
PTTAR Clean Fuel Project	PTTAR Co., Ltd. / CDI / Map Ta Phut	Fuel Steel Stack - 1sets - Dual Wall Type 5Stage (80 m)	S Mar. 10 F Sep. 10	
SIPCO 160MW Co-Generation Project	Siam Power/Generation (Public) Co., Ltd. / Ban Kay	Main Stack Fabrication	S Mar.09 F Aug.09	
Technip MOC Cracking Furnace	Technip & MOC / Map Ta Phut	Erection of Ethylene Cracking Furnace and Furnace Piping Work (8 Sets, 9,700 Tons) - KUBOTA STEEL/P11/P12, 68,000DB	S Sep. '07 F Aug. '09	
Plant 2 Bottleneck Project Cracking Furnace Unit	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	Cracking Furnace (1 Set, 480 Tons) - Coil material P11, P12 Alloy	S Dec. '06 F Nov. '08	
ROC Furnace Q Project	Rayong Olefins Co., Ltd. / Map Ta Phut	Cracking Furnace (1 Set, 600 Tons) - Coil material P11, P12 Alloy LPG	S Sep. '05 F Mar. '07	

7-3. Team Experience for Coil & Piping Fabrication



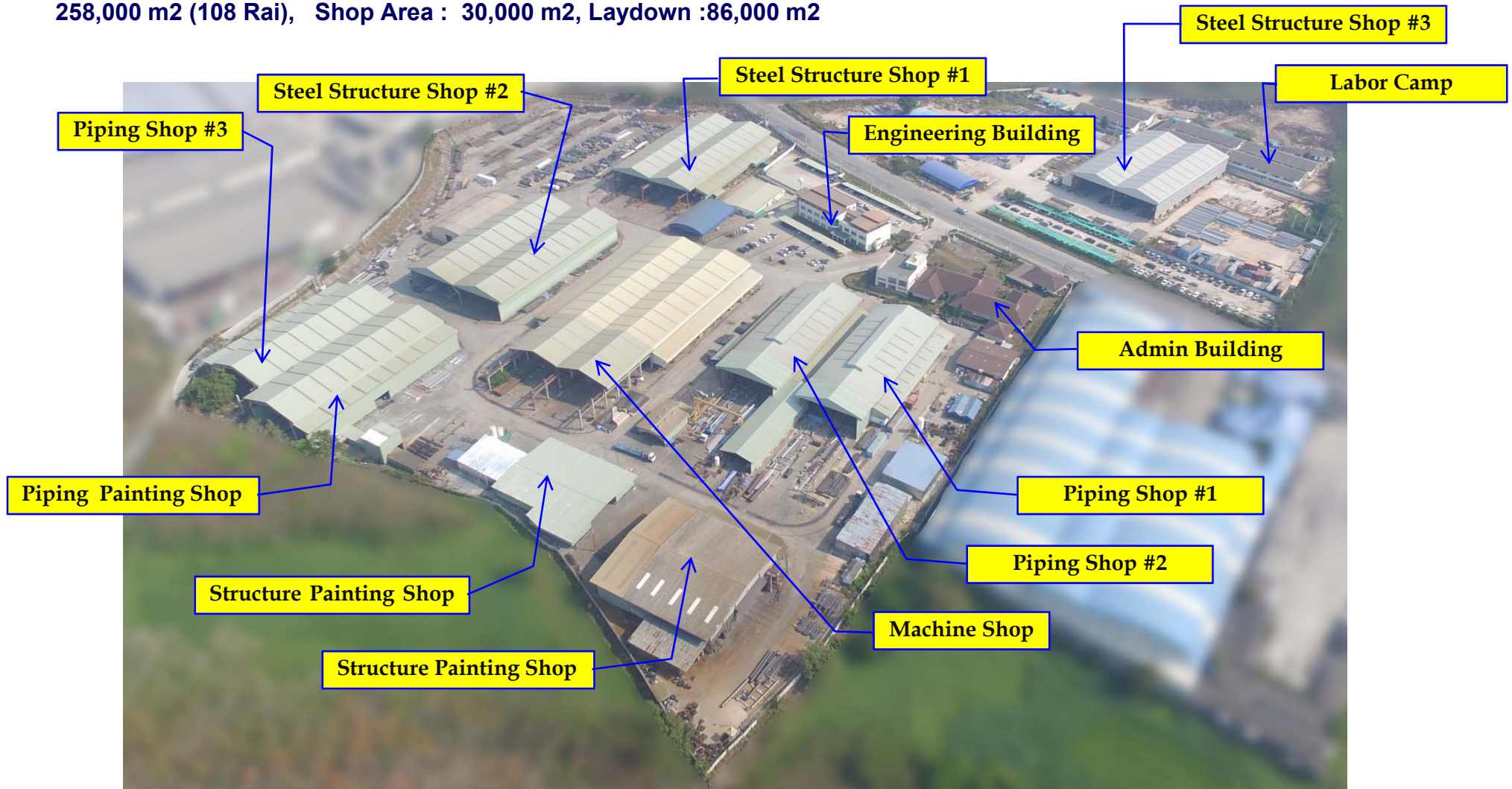
Year	Project Name	Volume
2012	SAMUR Project	P11/P22/TP304H/321H / 18,800 DB
2012	West Qurma II Project	A106B / 6,000 DB
2012	Algiers Refinery Project	P5/P9/P11/P22 / 11,500 DB
2012	South Par Project	A106B / 2,800 DB
2012	RMP Project	P9/P11/TP347H / 4,600 DB
2011	JAC Project	P9/P11/P22/TP304H/TP321H/TP347H / 51,000 DB
2011	Tianjin China Project	P11/TP321/TP347 / 9,600 DB
2009	MOC Cracking Furnace	KUBOTA STEEL/P11/P12 / 68,000 DB
2008	PTT Chem. LPG Cracking Furnace	P11/P12 / 18,000 DB
2007	PTT Tank Terminal Project (ROC Ethylene Cracking Furnace)	P11/P12 / 24,000 DB

Major Facilities

8. Office & Fabrication Shop

Factory #1 : Piping & Mechanical Fabrication

258,000 m2 (108 Rai), Shop Area : 30,000 m2, Laydown :86,000 m2



8. Office & Fabrication Shop

- Office & Shop Panorama



Factory #2 (Pluak Dang Work Shop) : Structure Fabrication

127,000 m² (79 Rai), Shop Area : 10,200 m², Laydown Area : 116,800 m²



8. Office & Fabrication Shop

- Office & Shop Panorama



CAZ Shop

Laydown Area

#3 Laydown : 30,000 m² (1.5 Km from Shop)



#4 Module & Laydown : 67,000 m² (15 km from Shop)

Module Yard



Laydown Area

#2 Laydown : 50,000 m² (1.5 Km from Shop)

8. Office & Fabrication Shop

- Major Shop Equip. & Tools



Equipment Category	Q'ty	Unit	Equipment Category	Q'ty	Unit
PLASMA CUTTING MACHINE	1	Set	Laser Cutting & Drilling Machine	1	Set
CNC Shape Drill Cutting Machine (Auto)	2	Set	Plate Bending Roller (~ 25 T)	1	Set
CNC Plate Cutting Machine	3	Set	Plate Bending Roller (~ 50 T)	1	Set
CNC Band Saw (High Speed)	1	Set	CNC Pipe Cutting Machine	1	Set
CNC Plate Drill Machine (~100mm)	4	Ea	Hydraulic Press Machine (1,500 Tons)	1	Set
Band Saw (Amada) ~600 mm	1	Ea	Overhead Crane (30 Tons)	2	Ea
Band Saw (Shoper) ~ 300 mm	1	Ea	Overhead Crane (10 Tons)	14	Ea
CNC Beveling & Scallop M/C	1	Set	Overhead Crane (5 Tons)	10	Ea
Pipe & Shape Steel Hydraulic Rolling M/C	1	Set	Gantry Crane (10 Tons)	6	Ea
PWHT MACHINE: MH-RG60 1 SET	8	Set	Gantry Crane (5 Tons)	2	Ea
Auto Welding Manipulator	2	Set	Blasting Tool Set	4	Set
Welding M/C (CO2 FCAW)	106	Ea	Painting Spay Tool Set	6	Set
Welding M/C (SMAW / Mig / Tig)	125	Ea			

8. Office & Fabrication Shop

- Major Shop Equipment



Pipe & Shape Hydraulic Rolling M/C



CNC Plate Cutting M/C



Hydraulic Press M/C (1,500 Tons)



CNC Scallop M/C



CNC Shape Drill Cutting M/C



Plate Bending Roller



CO2 FCAW Welding M/C



CNC Band Saw



Auto WELDING MANIPULATOR



8. Office & Fabrication Shop

- Major Shop Equipment



Laser Cutting & Drilling M/C



Plate Drilling M/C : 2 Sets



Beveling M/C



Plasma Cutting M/C



SAW Welding M/C



CNC Scallop & Bevel M/C



Shape Steel Roll M/C



CO2 FCAW Welding M/C 120 sets



8. Office & Fabrication Shop

- Major Construction Equip.



Equipment Category	Q'ty	Unit	Equipment Category	Q'ty	Unit
HIAP TRUCK (5 TON)	3	Ea	JCB	2	Ea
Crane (25 Ton)	1	Ea	Trailer	4	Ea
Folk Lift (5 Ton)	4	Ea	Roller Compactor (10 ton)	1	Ea
Folk Lift (10 Ton)	1	Ea	Roller Compactor (5Ton)	1	Ea
Wheel Loader (5 Ton)	1	Ea	Air Compressor	5	Ea
Back Hoe (PC-200)	1	Ea	5 ton Truck (Songtaew)	1	Ea
Back Hoe (PC-120)	1	Ea	Office Container	25	Ea
Back Hoe (PC-40)	1	Ea	Mobile Toilet	4	Ea
Water Truck	1	Ea	Labor Camp	240	Room
Oil Tank Truck	1	Ea	Boom Lift	3	Ea
Dump Truck	5	Ea			
Generator (9 – 50 KVA)	6	Ea			

8. Office & Fabrication Shop

- Major Construction Equip.



Back Hoe(PC-200)



Back Hoe(PC-120)



Back Hoe(PC-40)



Dump Truck(10Wheel)



Dump Truck(6Wheel)



Water Truck(10Wheel)



Hiab Truck(10Wheel)



Roller Compactor(10ton)



Roller Compactor(4ton)



8. Office & Fabrication Shop

- Major Construction Equip.



Crane (25 Ton)



Folk Lift (10 Ton)



Folk Lift (5 Ton)



Air Compressor



Trailer



Wheel Loader



JCB



Oil Truck

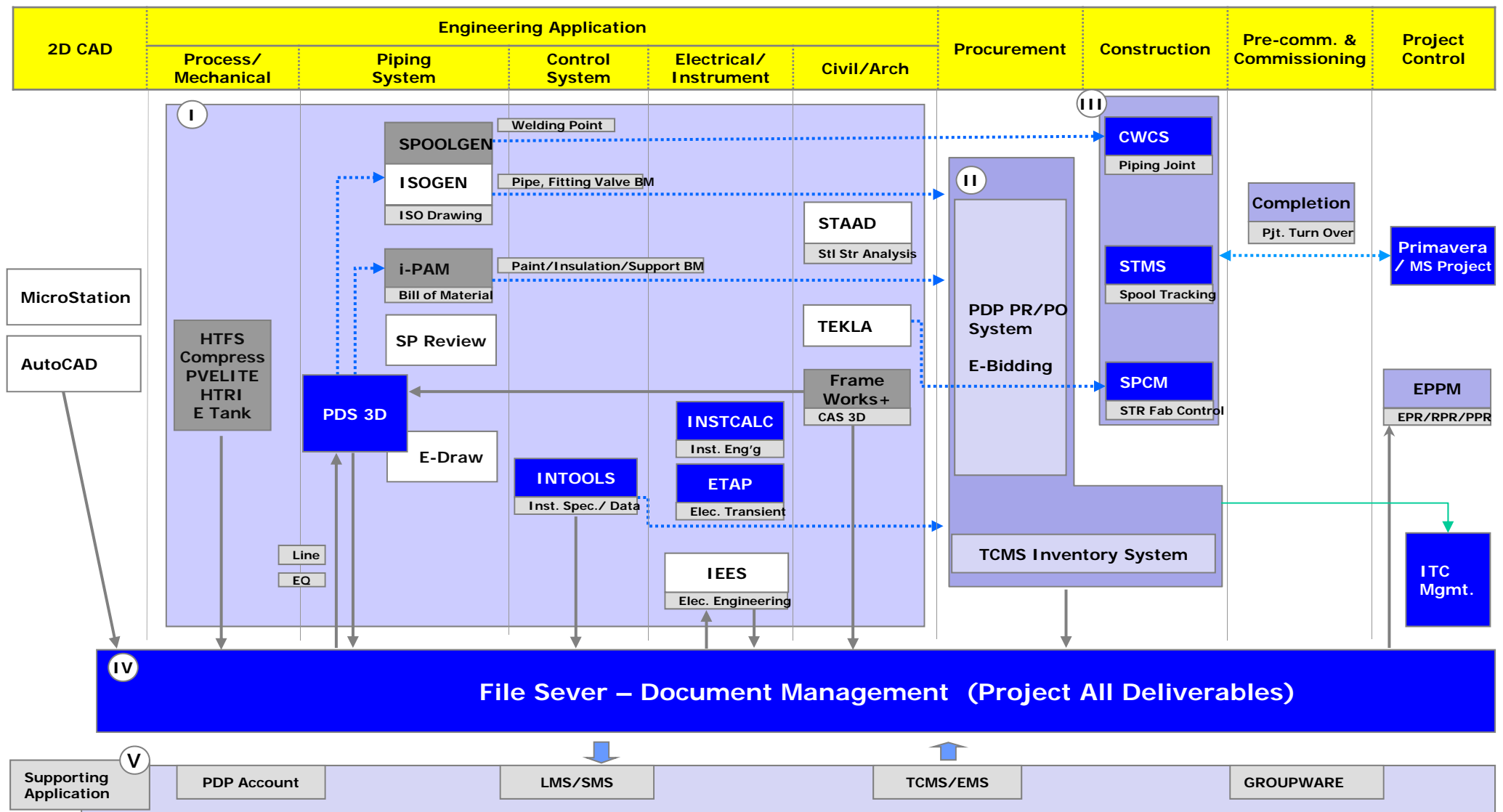


Labor Camp



CAZ IT System

Overall Application Architecture



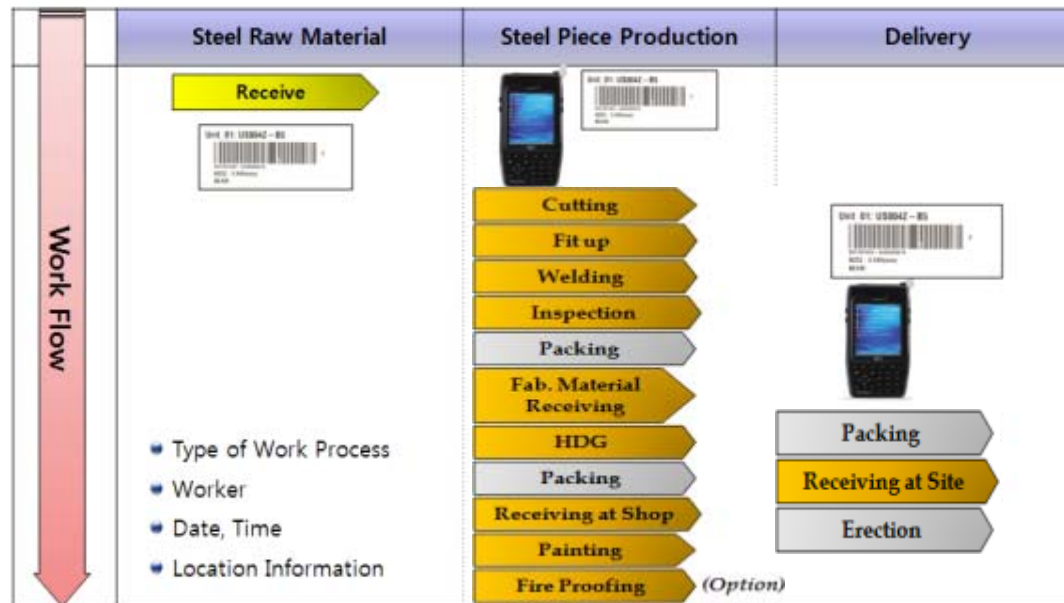
IT System for Construction

9-1. IT System for Construction

- STR. Production Control System (SPCM)



System is based on Bar-Code & GPS System



- Data Management for Raw Materials
- Production Management for Steel Members
- Delivery Management for Steel Members
- Searching & Reporting for Status of Production
- Operating of Each Project



GPS

Input Work Count: 3

ARRIVAL

SCAN PACKAGE BARCODE

Barcode: T001SPCM0002-0011

DateTime: 11-05-28 10:56:37

Worker: admin

Work Process	Package Barcode
Arrival	T001SPCM0002-0006
Arrival	T001SPCM0002-0002
Arrival	T001SPCM0002-0011

MAIN BACK

Select Work PROC

FAB	FAB Inspection
PAINT	PAINT Inspection
Packing	

NEXT

MAIN SELECT

Select Work PROC

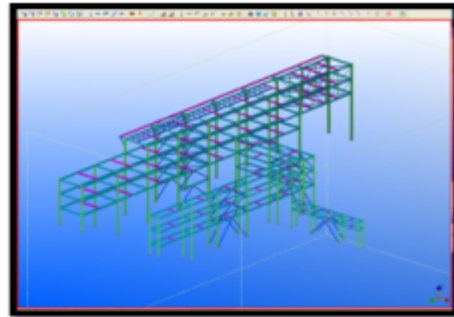
Delivery	Arrival
At Site	Install
Final Inspection	

PREVIOUS

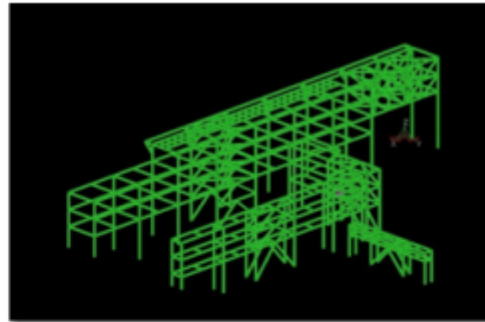
MAIN SELECT



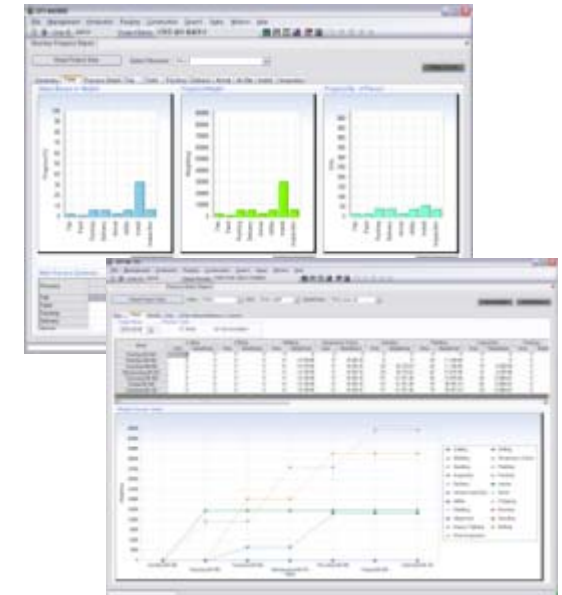
<Overall Work Procedure for SPCM>



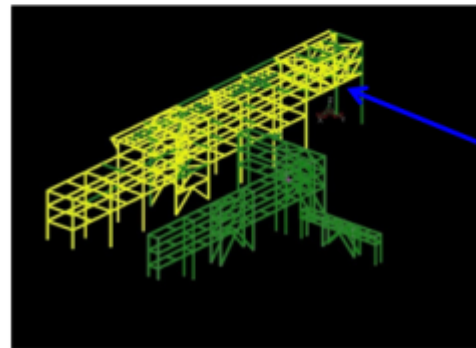
< TEKLA 3D >



< SPCM 3D >



< Automation Report >



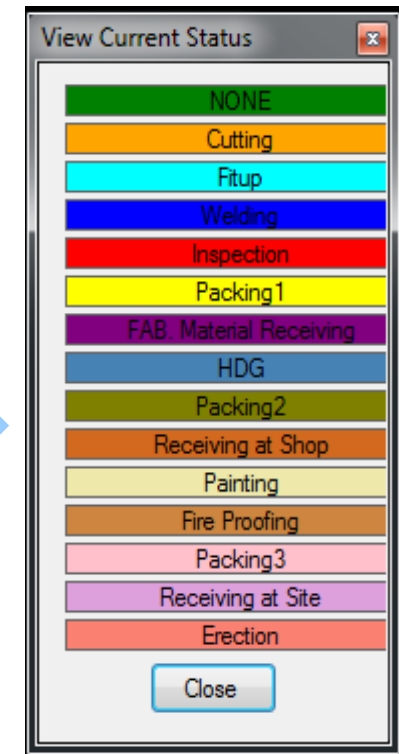
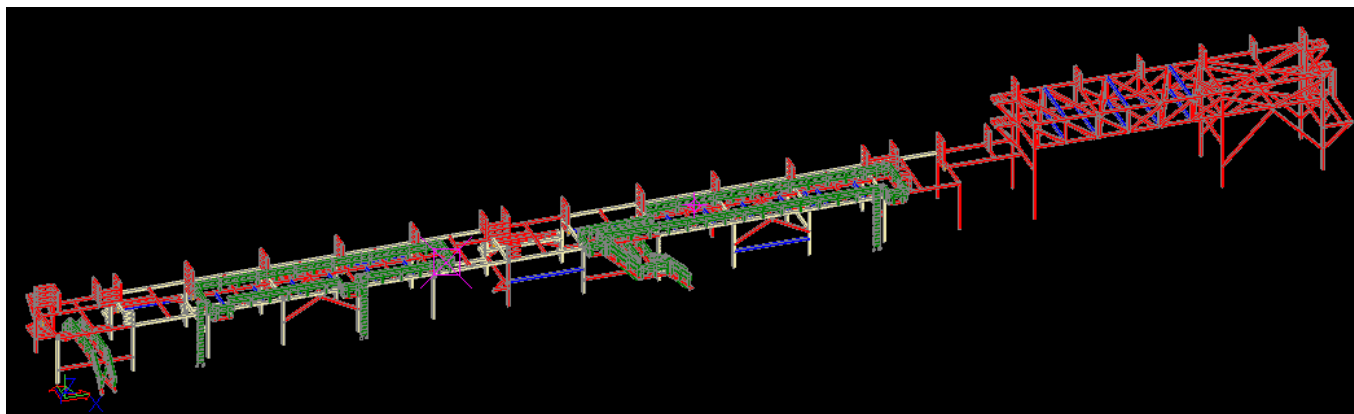
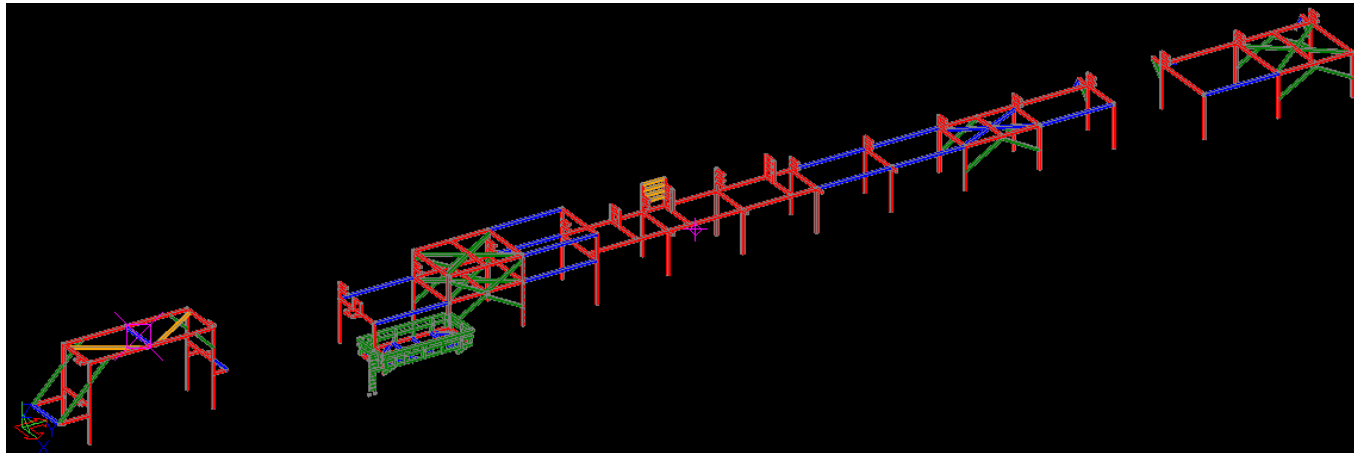
< 4D Search >



Yellow : Completed
(Checking Function by process & color)

- Cutting
- Fit up
- Welding
- Inspection
- Packing
- Fab. Material Receiving
- HDG
- Packing
- Receiving at Shop
- Painting
- Fire Proofing
- Packing
- Receiving at Site
- Erection

<Overall Work Procedure for SPCM>



9-1. IT System for Construction

- System is based on Web Version

Log-In Screen



Report List

- Progress Report : 5 kinds
- Inspection Report : 3 kinds
- Spool Report : 3 kinds
- NDE Report : 9 kinds
- Welder Report : 5 kinds

- CAZ Welding Control System(CWCS)



Daily Welding Inspection Report

Shop & Field Welding Progress Report

Spool Fabrication Status

9-1. IT System for Construction

- CAZ Welding Control System(CWCS)



Test Package Report

TEST NO.	TEST NAME	TEST DATE	TEST TIME	TEST RESULT	TEST STATUS	TEST COMMENTS
1	Welding Test 1	2023-10-01	10:00	Pass	Completed	
2	Welding Test 2	2023-10-01	10:15	Pass	Completed	
3	Welding Test 3	2023-10-01	10:30	Pass	Completed	
4	Welding Test 4	2023-10-01	10:45	Pass	Completed	
5	Welding Test 5	2023-10-01	11:00	Pass	Completed	
6	Welding Test 6	2023-10-01	11:15	Pass	Completed	
7	Welding Test 7	2023-10-01	11:30	Pass	Completed	
8	Welding Test 8	2023-10-01	11:45	Pass	Completed	
9	Welding Test 9	2023-10-01	12:00	Pass	Completed	
10	Welding Test 10	2023-10-01	12:15	Pass	Completed	
11	Welding Test 11	2023-10-01	12:30	Pass	Completed	
12	Welding Test 12	2023-10-01	12:45	Pass	Completed	
13	Welding Test 13	2023-10-01	13:00	Pass	Completed	
14	Welding Test 14	2023-10-01	13:15	Pass	Completed	
15	Welding Test 15	2023-10-01	13:30	Pass	Completed	
16	Welding Test 16	2023-10-01	13:45	Pass	Completed	
17	Welding Test 17	2023-10-01	14:00	Pass	Completed	
18	Welding Test 18	2023-10-01	14:15	Pass	Completed	
19	Welding Test 19	2023-10-01	14:30	Pass	Completed	
20	Welding Test 20	2023-10-01	14:45	Pass	Completed	
21	Welding Test 21	2023-10-01	15:00	Pass	Completed	
22	Welding Test 22	2023-10-01	15:15	Pass	Completed	
23	Welding Test 23	2023-10-01	15:30	Pass	Completed	
24	Welding Test 24	2023-10-01	15:45	Pass	Completed	
25	Welding Test 25	2023-10-01	16:00	Pass	Completed	
26	Welding Test 26	2023-10-01	16:15	Pass	Completed	
27	Welding Test 27	2023-10-01	16:30	Pass	Completed	
28	Welding Test 28	2023-10-01	16:45	Pass	Completed	
29	Welding Test 29	2023-10-01	17:00	Pass	Completed	
30	Welding Test 30	2023-10-01	17:15	Pass	Completed	
31	Welding Test 31	2023-10-01	17:30	Pass	Completed	
32	Welding Test 32	2023-10-01	17:45	Pass	Completed	
33	Welding Test 33	2023-10-01	18:00	Pass	Completed	
34	Welding Test 34	2023-10-01	18:15	Pass	Completed	
35	Welding Test 35	2023-10-01	18:30	Pass	Completed	
36	Welding Test 36	2023-10-01	18:45	Pass	Completed	
37	Welding Test 37	2023-10-01	19:00	Pass	Completed	
38	Welding Test 38	2023-10-01	19:15	Pass	Completed	
39	Welding Test 39	2023-10-01	19:30	Pass	Completed	
40	Welding Test 40	2023-10-01	19:45	Pass	Completed	
41	Welding Test 41	2023-10-01	20:00	Pass	Completed	
42	Welding Test 42	2023-10-01	20:15	Pass	Completed	
43	Welding Test 43	2023-10-01	20:30	Pass	Completed	
44	Welding Test 44	2023-10-01	20:45	Pass	Completed	
45	Welding Test 45	2023-10-01	21:00	Pass	Completed	
46	Welding Test 46	2023-10-01	21:15	Pass	Completed	
47	Welding Test 47	2023-10-01	21:30	Pass	Completed	
48	Welding Test 48	2023-10-01	21:45	Pass	Completed	
49	Welding Test 49	2023-10-01	22:00	Pass	Completed	
50	Welding Test 50	2023-10-01	22:15	Pass	Completed	

Status for Welder Efficiency

WELDER	WELDER ID	WELDER NAME	WELDER TYPE	WELDER STATUS	WELDER EFFICIENCY	WELDER COST	WELDER TIME	WELDER DATE	WELDER COMMENTS
Welder 1	W1001	John Doe	Welder	Active	95%	\$100,000	1000	2023-10-01	
Welder 2	W1002	Jane Smith	Welder	Active	90%	\$120,000	1200	2023-10-01	
Welder 3	W1003	Mike Johnson	Welder	Active	85%	\$150,000	1500	2023-10-01	
Welder 4	W1004	Sarah Brown	Welder	Active	80%	\$180,000	1800	2023-10-01	
Welder 5	W1005	David Wilson	Welder	Active	75%	\$200,000	2000	2023-10-01	
Welder 6	W1006	Emily Davis	Welder	Active	70%	\$220,000	2200	2023-10-01	
Welder 7	W1007	Chris Miller	Welder	Active	65%	\$250,000	2500	2023-10-01	
Welder 8	W1008	Alice Taylor	Welder	Active	60%	\$280,000	2800	2023-10-01	
Welder 9	W1009	Bob White	Welder	Active	55%	\$300,000	3000	2023-10-01	
Welder 10	W1010	Charlie Black	Welder	Active	50%	\$320,000	3200	2023-10-01	
Welder 11	W1011	Diana Green	Welder	Active	45%	\$350,000	3500	2023-10-01	
Welder 12	W1012	Frank Blue	Welder	Active	40%	\$380,000	3800	2023-10-01	
Welder 13	W1013	Grace Yellow	Welder	Active	35%	\$400,000	4000	2023-10-01	
Welder 14	W1014	Henry Purple	Welder	Active	30%	\$420,000	4200	2023-10-01	
Welder 15	W1015	Ivy Pink	Welder	Active	25%	\$450,000	4500	2023-10-01	
Welder 16	W1016	Jack Orange	Welder	Active	20%	\$480,000	4800	2023-10-01	
Welder 17	W1017	Karen Red	Welder	Active	15%	\$500,000	5000	2023-10-01	
Welder 18	W1018	Leo Brown	Welder	Active	10%	\$520,000	5200	2023-10-01	
Welder 19	W1019	Mia Green	Welder	Active	5%	\$550,000	5500	2023-10-01	
Welder 20	W1020	Noah Blue	Welder	Active	0%	\$580,000	5800	2023-10-01	

RT Shooting Status Report

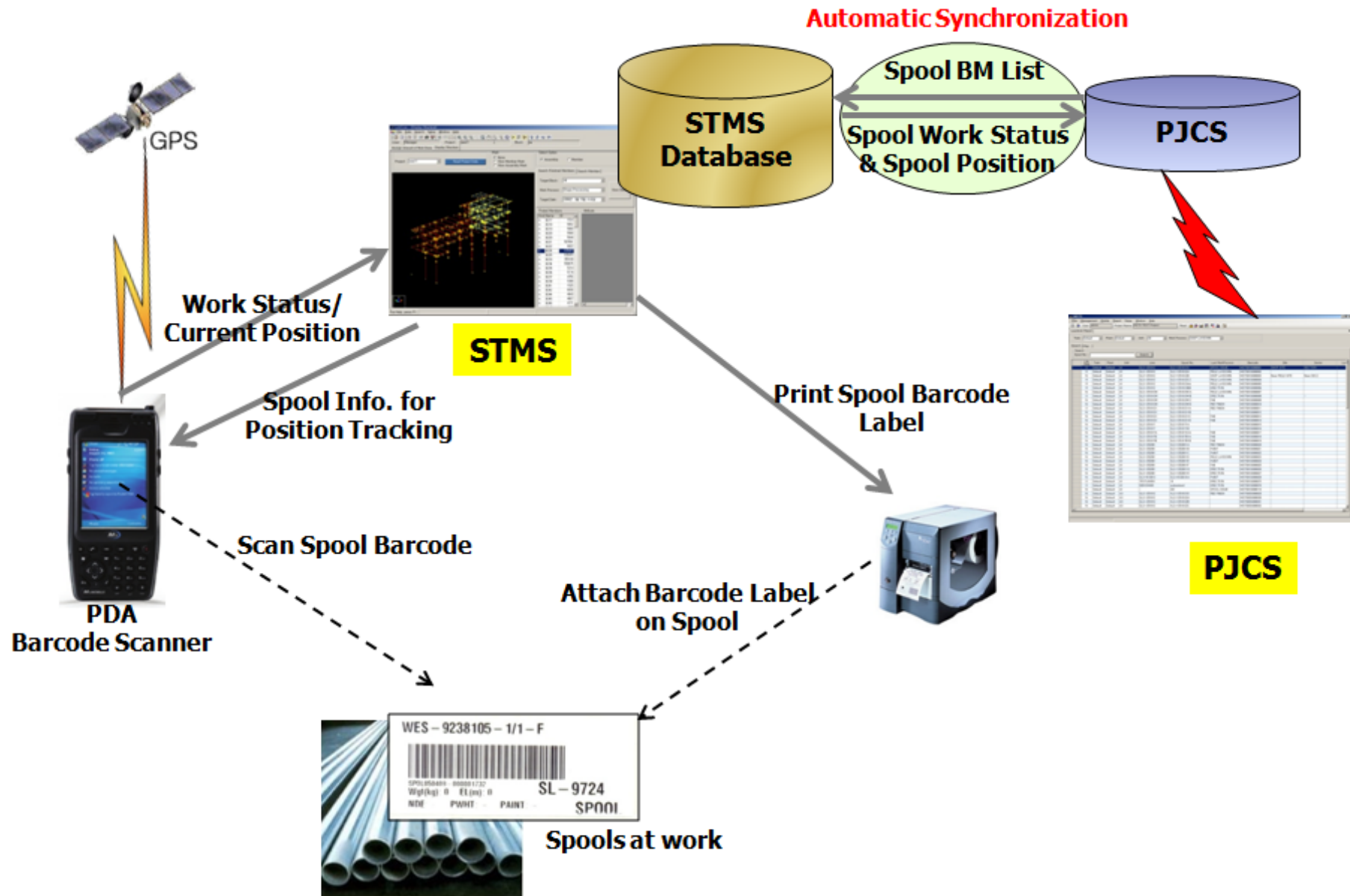
SHOOTING NO.	SHOOTING NAME	SHOOTING DATE	SHOOTING TIME	SHOOTING STATUS	SHOOTING RESULT	SHOOTING COMMENTS
1	Shooting Test 1	2023-10-01	10:00	Pass	Completed	
2	Shooting Test 2	2023-10-01	10:15	Pass	Completed	
3	Shooting Test 3	2023-10-01	10:30	Pass	Completed	
4	Shooting Test 4	2023-10-01	10:45	Pass	Completed	
5	Shooting Test 5	2023-10-01	11:00	Pass	Completed	
6	Shooting Test 6	2023-10-01	11:15	Pass	Completed	
7	Shooting Test 7	2023-10-01	11:30	Pass	Completed	
8	Shooting Test 8	2023-10-01	11:45	Pass	Completed	
9	Shooting Test 9	2023-10-01	12:00	Pass	Completed	
10	Shooting Test 10	2023-10-01	12:15	Pass	Completed	
11	Shooting Test 11	2023-10-01	12:30	Pass	Completed	
12	Shooting Test 12	2023-10-01	12:45	Pass	Completed	
13	Shooting Test 13	2023-10-01	13:00	Pass	Completed	
14	Shooting Test 14	2023-10-01	13:15	Pass	Completed	
15	Shooting Test 15	2023-10-01	13:30	Pass	Completed	
16	Shooting Test 16	2023-10-01	13:45	Pass	Completed	
17	Shooting Test 17	2023-10-01	14:00	Pass	Completed	
18	Shooting Test 18	2023-10-01	14:15	Pass	Completed	
19	Shooting Test 19	2023-10-01	14:30	Pass	Completed	
20	Shooting Test 20	2023-10-01	14:45	Pass	Completed	
21	Shooting Test 21	2023-10-01	15:00	Pass	Completed	
22	Shooting Test 22	2023-10-01	15:15	Pass	Completed	
23	Shooting Test 23	2023-10-01	15:30	Pass	Completed	
24	Shooting Test 24	2023-10-01	15:45	Pass	Completed	
25	Shooting Test 25	2023-10-01	16:00	Pass	Completed	
26	Shooting Test 26	2023-10-01	16:15	Pass	Completed	
27	Shooting Test 27	2023-10-01	16:30	Pass	Completed	
28	Shooting Test 28	2023-10-01	16:45	Pass	Completed	
29	Shooting Test 29	2023-10-01	17:00	Pass	Completed	
30	Shooting Test 30	2023-10-01	17:15	Pass	Completed	
31	Shooting Test 31	2023-10-01	17:30	Pass	Completed	
32	Shooting Test 32	2023-10-01	17:45	Pass	Completed	
33	Shooting Test 33	2023-10-01	18:00	Pass	Completed	
34	Shooting Test 34	2023-10-01	18:15	Pass	Completed	
35	Shooting Test 35	2023-10-01	18:30	Pass	Completed	
36	Shooting Test 36	2023-10-01	18:45	Pass	Completed	
37	Shooting Test 37	2023-10-01	19:00	Pass	Completed	
38	Shooting Test 38	2023-10-01	19:15	Pass	Completed	
39	Shooting Test 39	2023-10-01	19:30	Pass	Completed	
40	Shooting Test 40	2023-10-01	19:45	Pass	Completed	
41	Shooting Test 41	2023-10-01	20:00	Pass	Completed	
42	Shooting Test 42	2023-10-01	20:15	Pass	Completed	
43	Shooting Test 43	2023-10-01	20:30	Pass	Completed	
44	Shooting Test 44	2023-10-01	20:45	Pass	Completed	
45	Shooting Test 45	2023-10-01	21:00	Pass	Completed	
46	Shooting Test 46	2023-10-01	21:15	Pass	Completed	
47	Shooting Test 47	2023-10-01	21:30	Pass	Completed	
48	Shooting Test 48	2023-10-01	21:45	Pass	Completed	
49	Shooting Test 49	2023-10-01	22:00	Pass	Completed	
50	Shooting Test 50	2023-10-01	22:15	Pass	Completed	

NDE Request Report

REQUEST NO.	REQUEST NAME	REQUEST DATE	REQUEST TIME	REQUEST STATUS	REQUEST RESULT	REQUEST COMMENTS
1	NDE Request 1	2023-10-01	10:00	Pass	Completed	
2	NDE Request 2	2023-10-01	10:15	Pass	Completed	
3	NDE Request 3	2023-10-01	10:30	Pass	Completed	
4	NDE Request 4	2023-10-01	10:45	Pass	Completed	
5	NDE Request 5	2023-10-01	11:00	Pass	Completed	
6	NDE Request 6	2023-10-01	11:15	Pass	Completed	
7	NDE Request 7	2023-10-01	11:30	Pass	Completed	
8	NDE Request 8	2023-10-01	11:45	Pass	Completed	
9	NDE Request 9	2023-10-01	12:00	Pass	Completed	
10	NDE Request 10	2023-10-01	12:15	Pass	Completed	
11	NDE Request 11	2023-10-01	12:30	Pass	Completed	
12	NDE Request 12	2023-10-01	12:45	Pass	Completed	
13	NDE Request 13	2023-10-01	13:00	Pass	Completed	
14	NDE Request 14	2023-10-01	13:15	Pass	Completed	
15	NDE Request 15	2023-10-01	13:30	Pass	Completed	
16	NDE Request 16	2023-10-01	13:45	Pass	Completed	
17	NDE Request 17	2023-10-01	14:00	Pass	Completed	
18	NDE Request 18	2023-10-01	14:15	Pass	Completed	
19	NDE Request 19	2023-10-01	14:30	Pass	Completed	
20	NDE Request 20	2023-10-01	14:45	Pass	Completed	
21	NDE Request 21	2023-10-01	15:00	Pass	Completed	
22	NDE Request 22	2023-10-01	15:15	Pass	Completed	
23	NDE Request 23	2023-10-01	15:30	Pass	Completed	
24	NDE Request 24	2023-10-01	15:45	Pass	Completed	
25	NDE Request 25	2023-10-01	16:00	Pass	Completed	
26	NDE Request 26	2023-10-01	16:15	Pass	Completed	
27	NDE Request 27	2023-10-01	16:30	Pass	Completed	
28	NDE Request 28	2023-10-01	16:45	Pass	Completed	
29	NDE Request 29	2023-10-01	17:00	Pass	Completed	
30	NDE Request 30	2023-10-01	17:15	Pass	Completed	
31	NDE Request 31	2023-10-01	17:30	Pass	Completed	
32	NDE Request 32	2023-10-01	17:45	Pass	Completed	
33	NDE Request 33	2023-10-01	18:00	Pass	Completed	
34	NDE Request 34	2023-10-01	18:15	Pass	Completed	
35	NDE Request 35	2023-10-01	18:30	Pass	Completed	
36	NDE Request 36	2023-10-01	18:45	Pass	Completed	
37	NDE Request 37	2023-10-01	19:00	Pass	Completed	
38	NDE Request 38	2023-10-01	19:15	Pass	Completed	
39	NDE Request 39	2023-10-01	19:30	Pass	Completed	
40	NDE Request 40	2023-10-01	19:45	Pass	Completed	
41	NDE Request 41	2023-10-01	20:00	Pass	Completed	
42	NDE Request 42	2023-10-01	20:15	Pass	Completed	
43	NDE Request 43	2023-10-01	20:30	Pass	Completed	
44	NDE Request 44	2023-10-01	20:45	Pass	Completed	
45	NDE Request 45	2023-10-01	21:00	Pass	Completed	
46	NDE Request 46	2023-10-01	21:15	Pass	Completed	
47	NDE Request 47	2023-10-01	21:30	Pass	Completed	
48	NDE Request 48	2023-10-01	21:45	Pass	Completed	
49	NDE Request 49	2023-10-01	22:00	Pass	Completed	
50	NDE Request 50	2023-10-01	22:15	Pass	Completed	

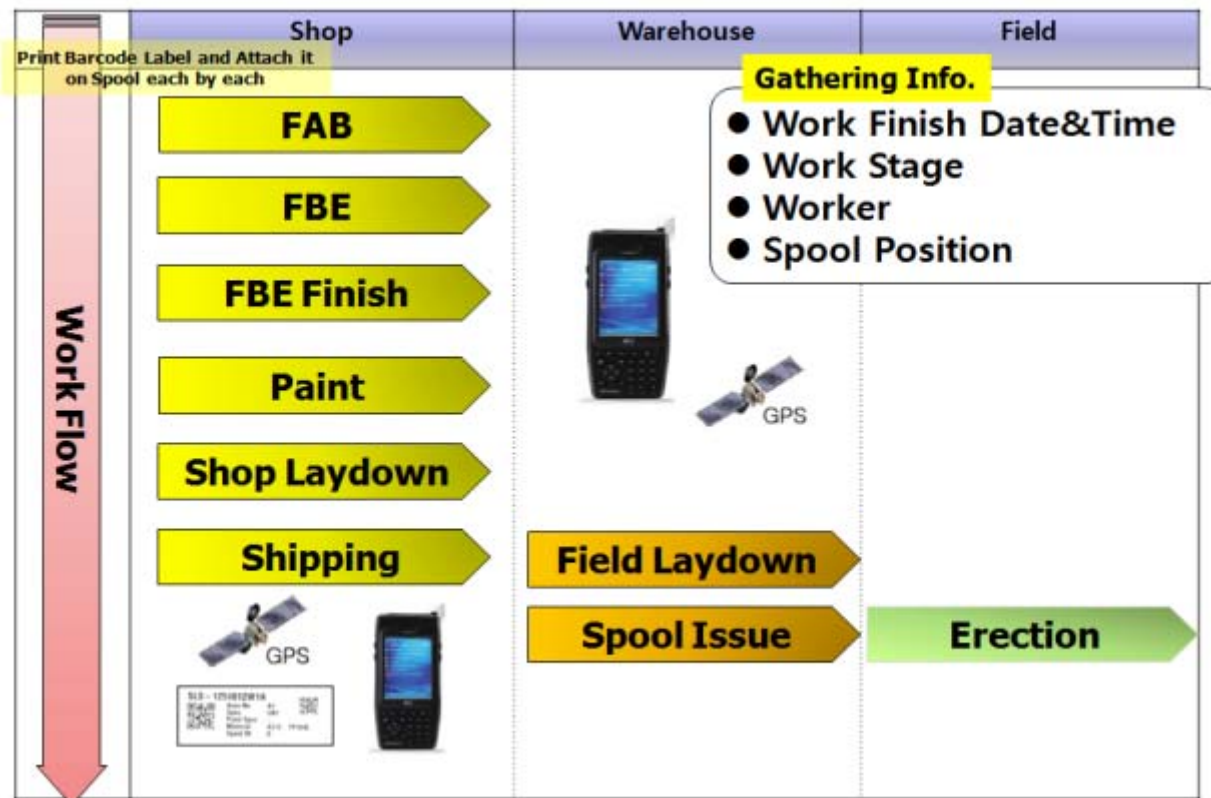
9-1. IT System for Construction

- Spool Tracking Mgmt. System(STMS)



9-1. IT System for Construction

- Spool Tracking Mgmt. System(STMS)



TRACK MATERIAL

Mem. No. **Search**

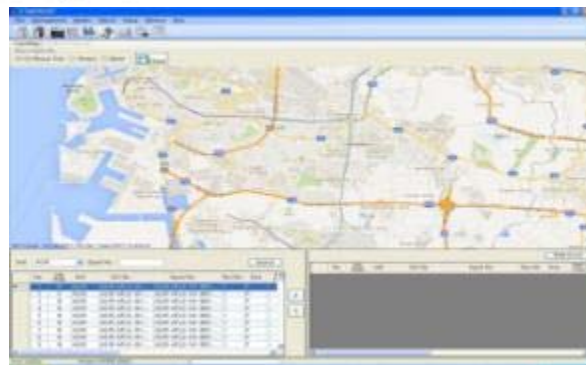
Area	F	Spool No.
A1	2	
A1	3	
A1	4	

☐ View only unfound Members

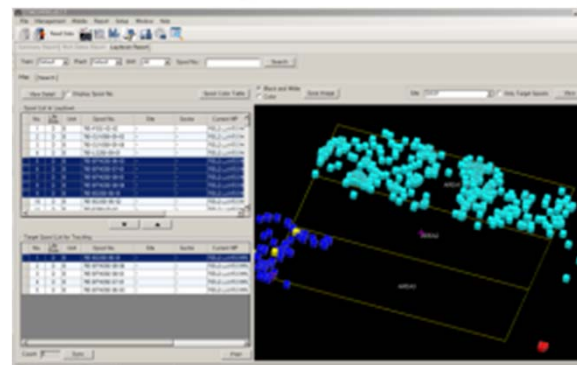
Total **3** F **0** R **3**

MAIN **TRACKING**

Tracking by PDA with GPS



STMS Google Map



STMS 3D Map

[AREA2 / SITE1]

>> D: 48 m **GPS Active**

NONE **PAN** **ROTATE** **ZOOM** **2.All**

M.Punch No.: 2
Distance: E -41.33 m N -24.4 m

AREA2

ME

Spool

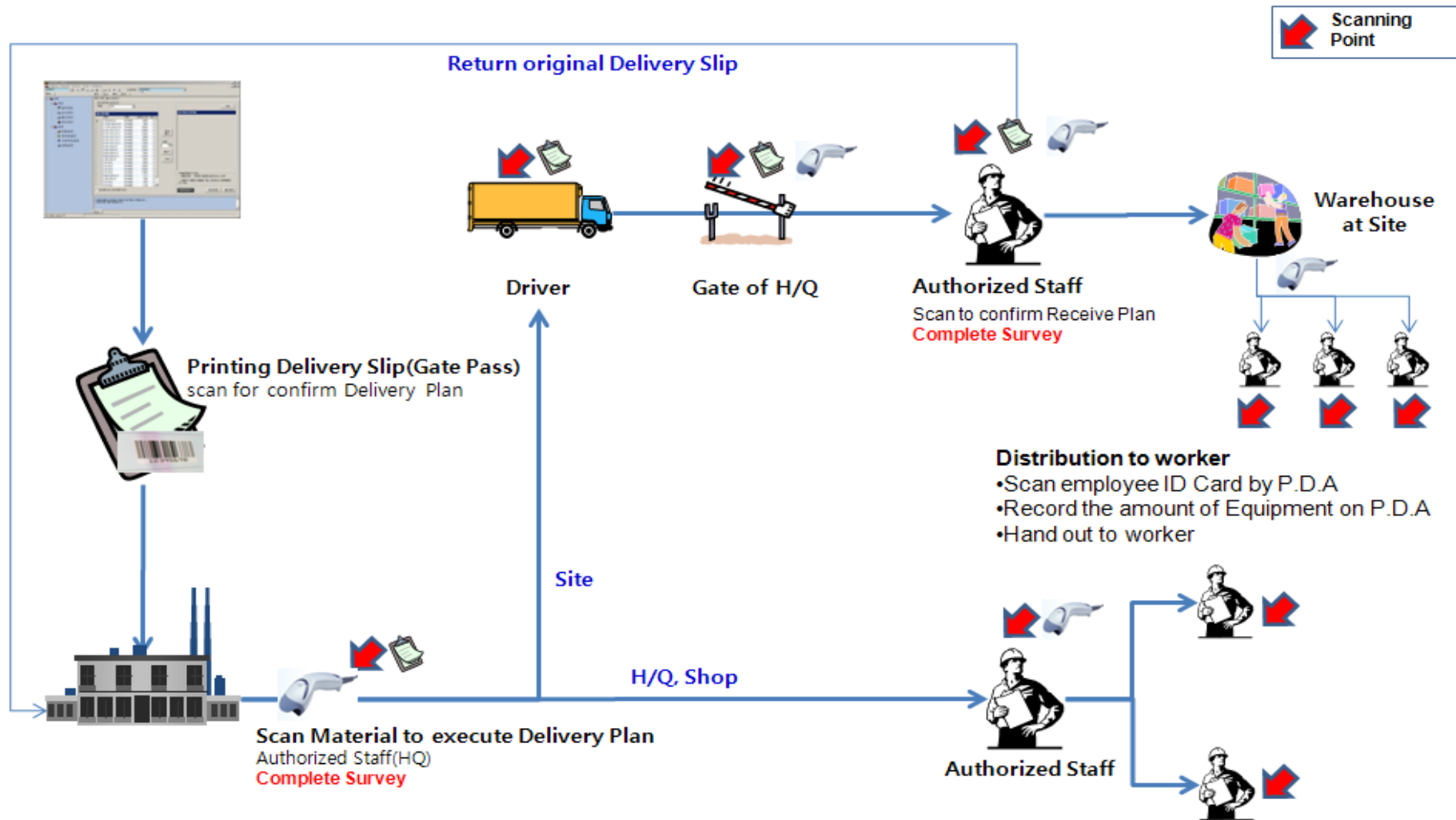
AREA1

MAIN **BACK**

9-1. IT System for Construction

- Tools, Asset & Consumable Mgmt. System(TCMS)

TCMS : Tools, Asset & Consumable Management System (Base on Bar-Code System)



IT System for Engineering

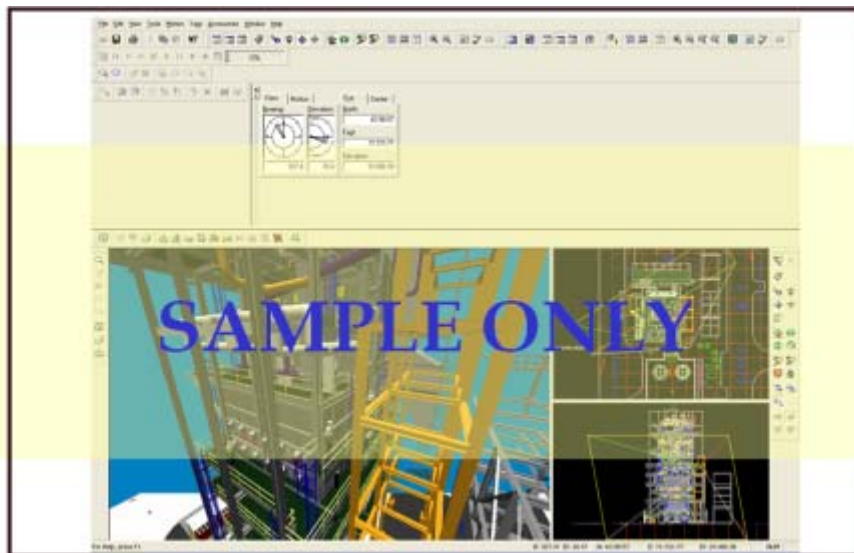
9-2. IT System for Engineering

- Piping Engineering

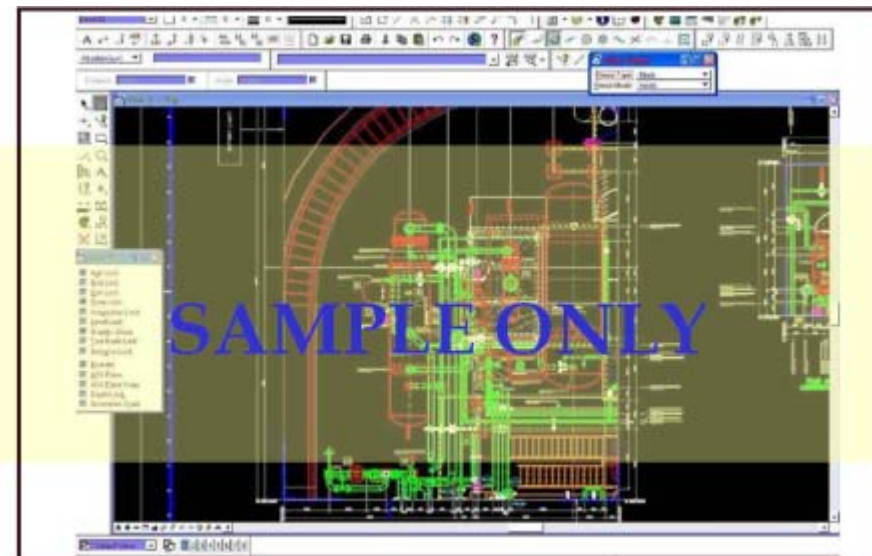


Program	Description
PDS	PLANT DESIGN SYSTEM Intergraph Software
MicroStation	Software by Bentley working with PDS
Caesar II	Piping Structural Stress Analysis
ACAD 2D, 3D	Piping Geometric drawing, Isometric drawing
Pro DSMS	AutoCAD Developed Program for Piping Designer

PDS (Plant Design System)



MicroStation



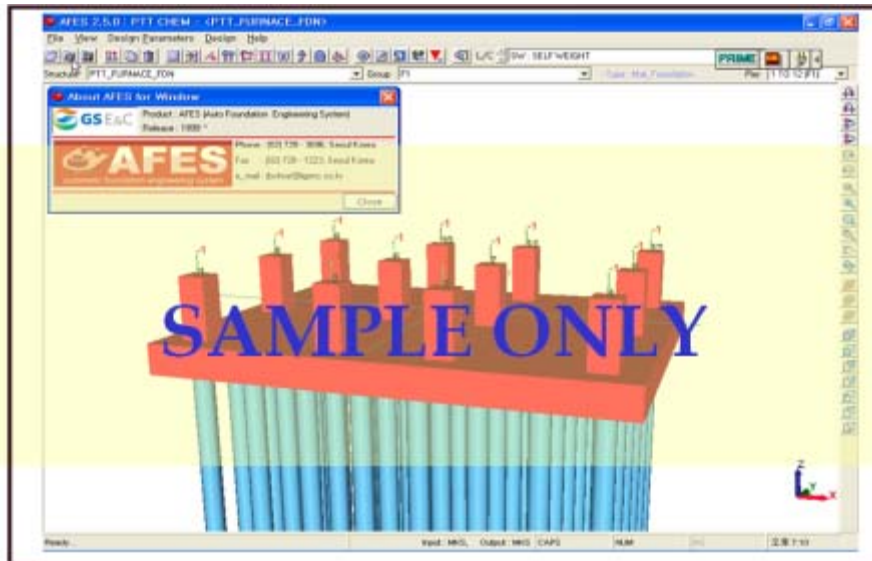
9-2. IT System for Engineering

- **Civil/Str./Arch. Engineering**

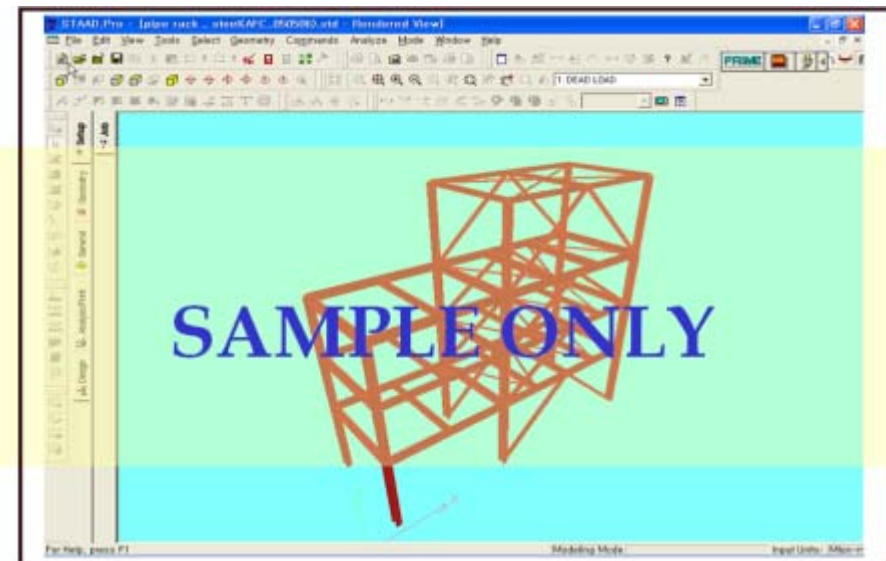


Program	Description
AFES	Automatic Foundation Engineering System
STAAD/PRO2001	Concrete & Steel Str. Cal. & Design Analysis
TEKLA, SPCM	Generate Structure Shop drawing
ACAD 2D, 3D	Generate Civil, Structure & Arch. Drawing
TAMP	CAZ AUTO MTO PROGRAM

AFES – Auto. FDN.



STAAD/PRO2001 – Concrete/Steel STR. Calc



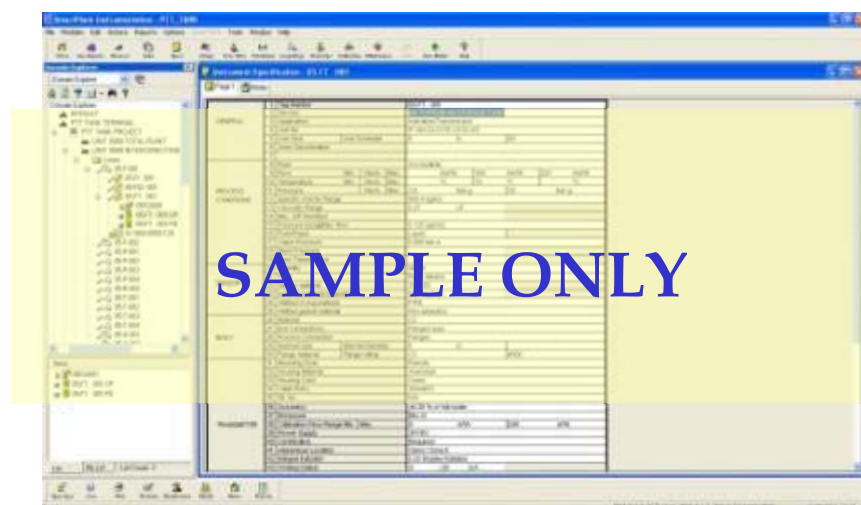
9-2. IT System for Engineering

- E&I Engineering

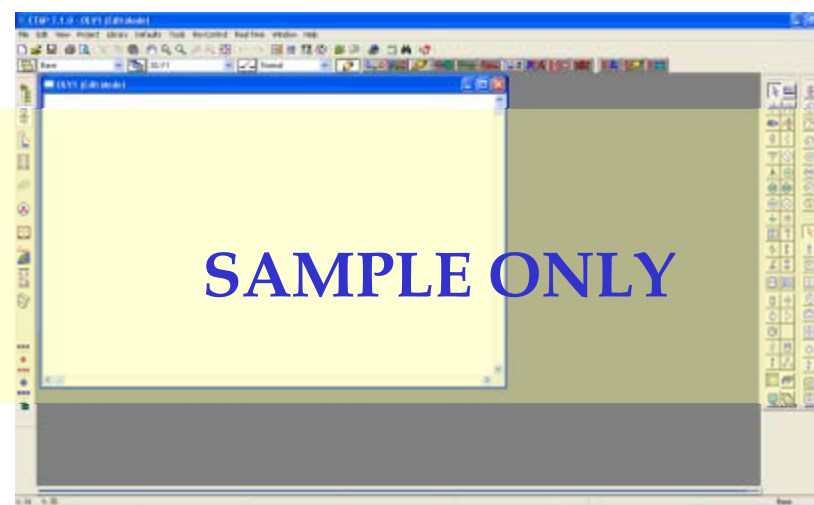


Program	Description
SP Instrumentation/INTOOLS	Software by Intergraph for Cable routing work with PDS software
ACAD 2D, 3D	AutoCAD generic E&I layout drawing and hook-up diagram etc.
TWRE ORIFICE CALC.	Orifice Sizing Calculation
EE – POWER	CAZ Voltage Drop Calc.
ETAP	CAZ Cable Sizing Calculation

INTOOLS



ETAP



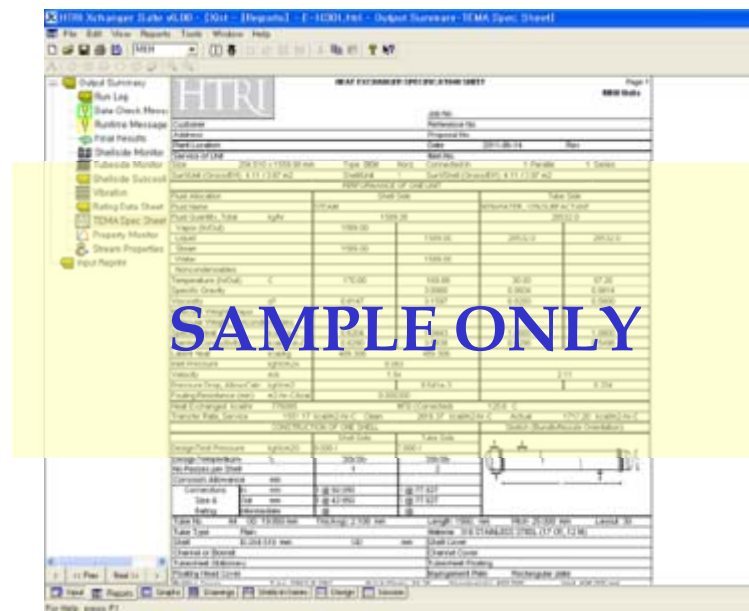
9-2. IT System for Engineering

- Tank/Vessel Engineering

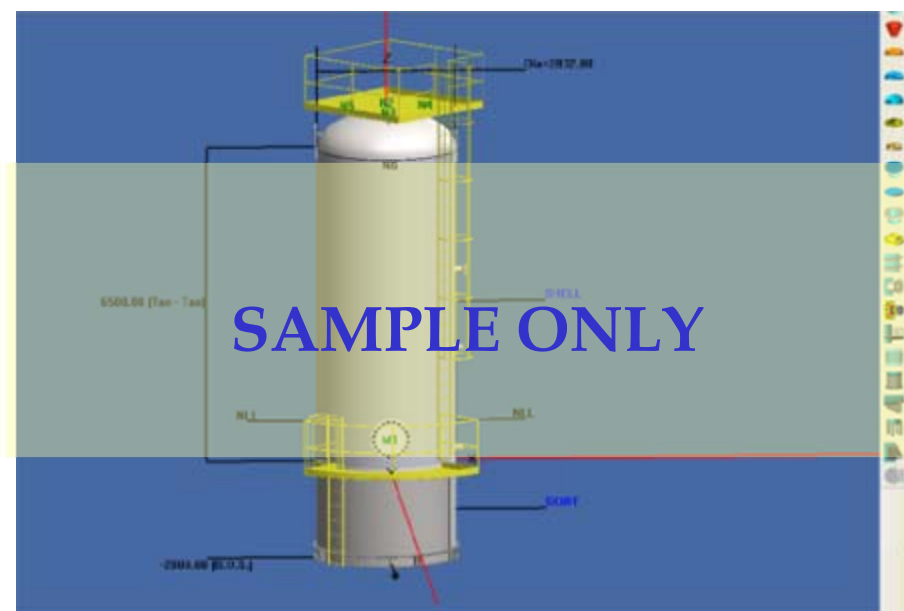


Program	Description
HTFS	Heat Exchanger Thermal rating Program
COMPRESS	Pressure Vessel & H-Ex. Calculation
PVELITE	Pressure vessel & H-Ex. Calculation
HTRI	Heat Exchanger Thermal rating Program
E TANK	Storage Tank Calculation

HTRI



COMPRESS



10

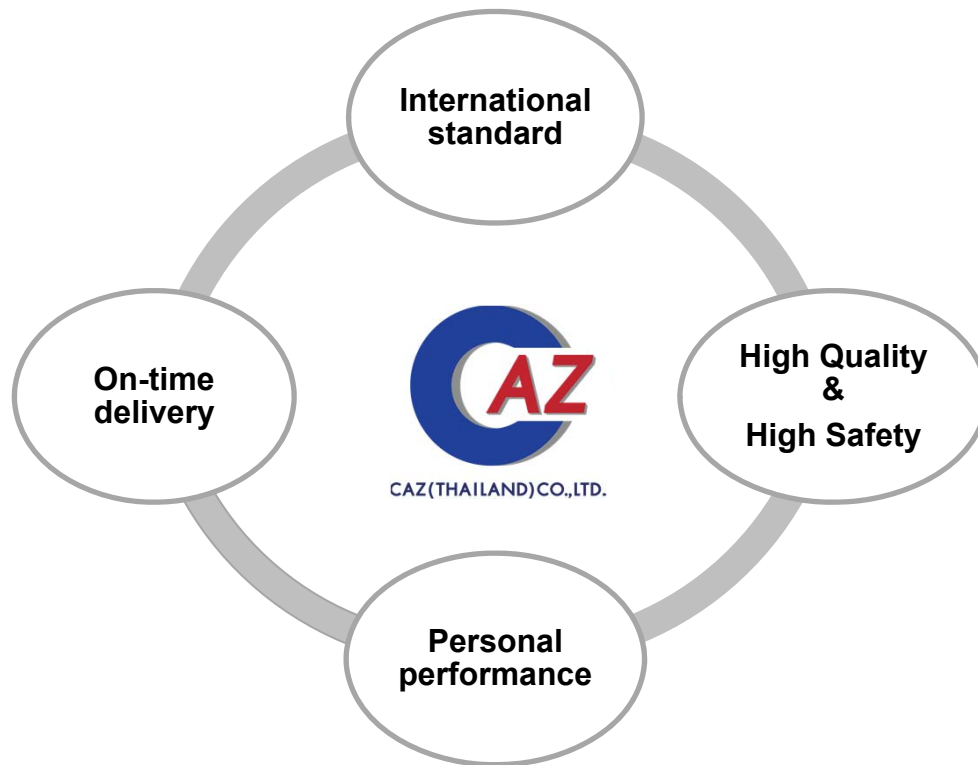
Quality



Quality Assurance

10. Quality Assurance

1) Quality Policy



- Quality Policy -

CAZ Co., Ltd. has established its quality policy in totally committed and takes pride in offering a construction work to clients in terms of cost, schedule, quality, standard and safe through our service with an excellence team work, to satisfy our customers through continual improvement approach. Our short slogan is defined as follow

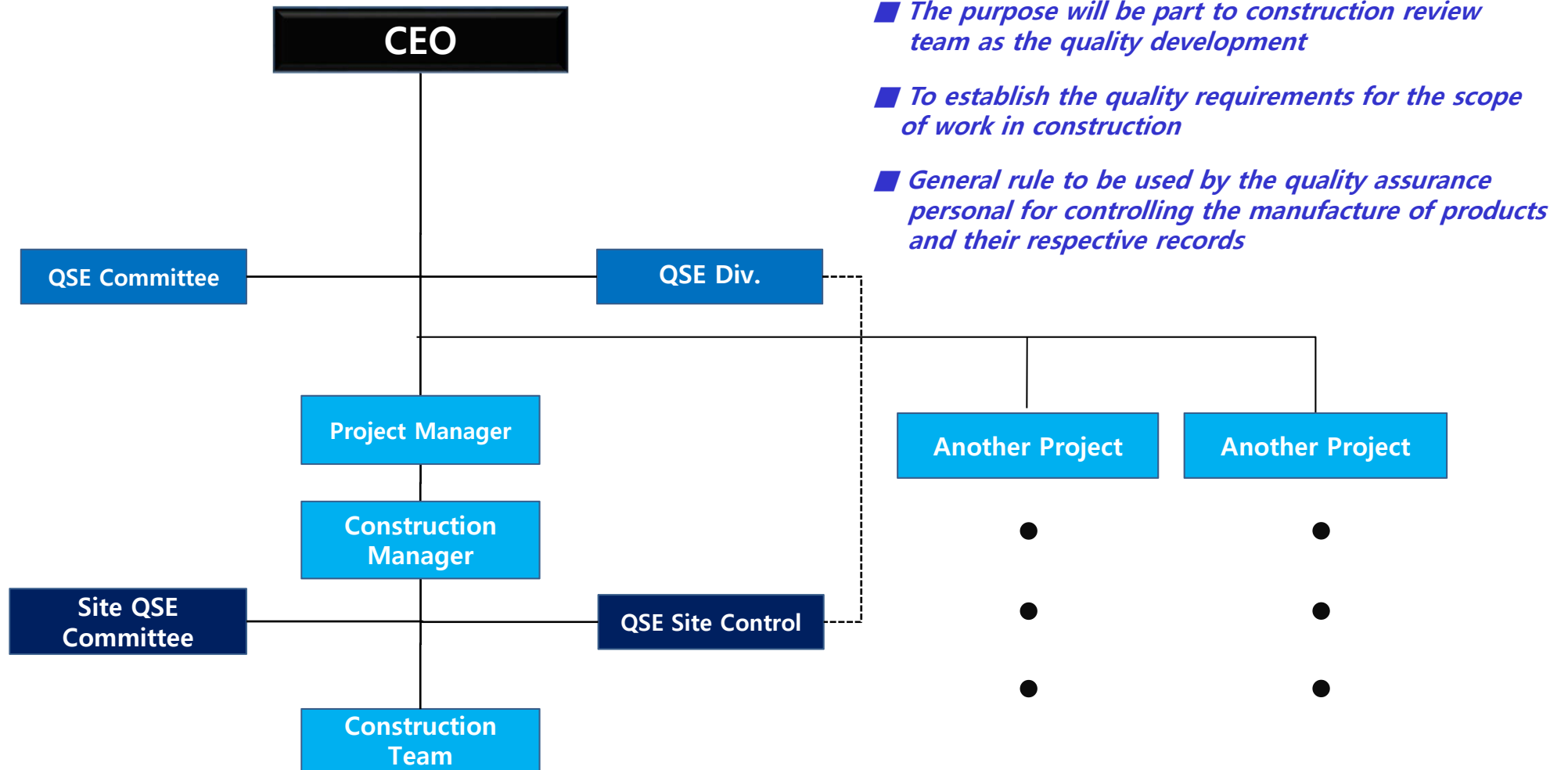
To ensure this the following strategic and scheme are required to implement with effectiveness.

- ✓ Establish a quality management system
- ✓ Provide quality construction work with highly standard, safety and on-time deliver performance to meet our customer's standard and requirements
- ✓ A training program has been established to increase potential capability and performance of our personnel.
- ✓ Establish the company strategic annual objectives and quantifiable targets and review its continuing suitability through management review activity

All personnel are required to understand and have responsibilities to implement, maintain and improve its performance to achieve this policy continually.

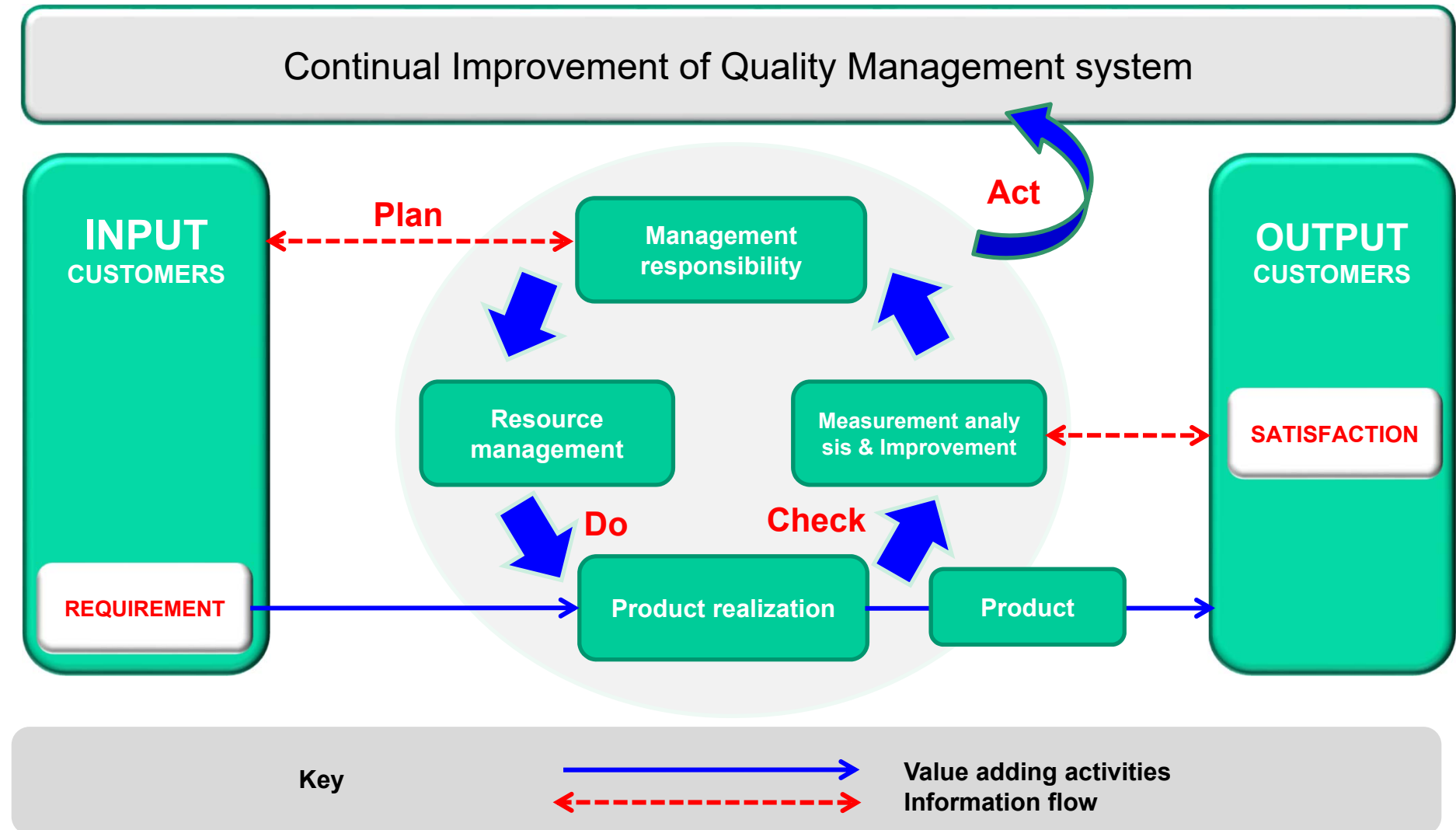
10. Quality Assurance

2) QSE Organization



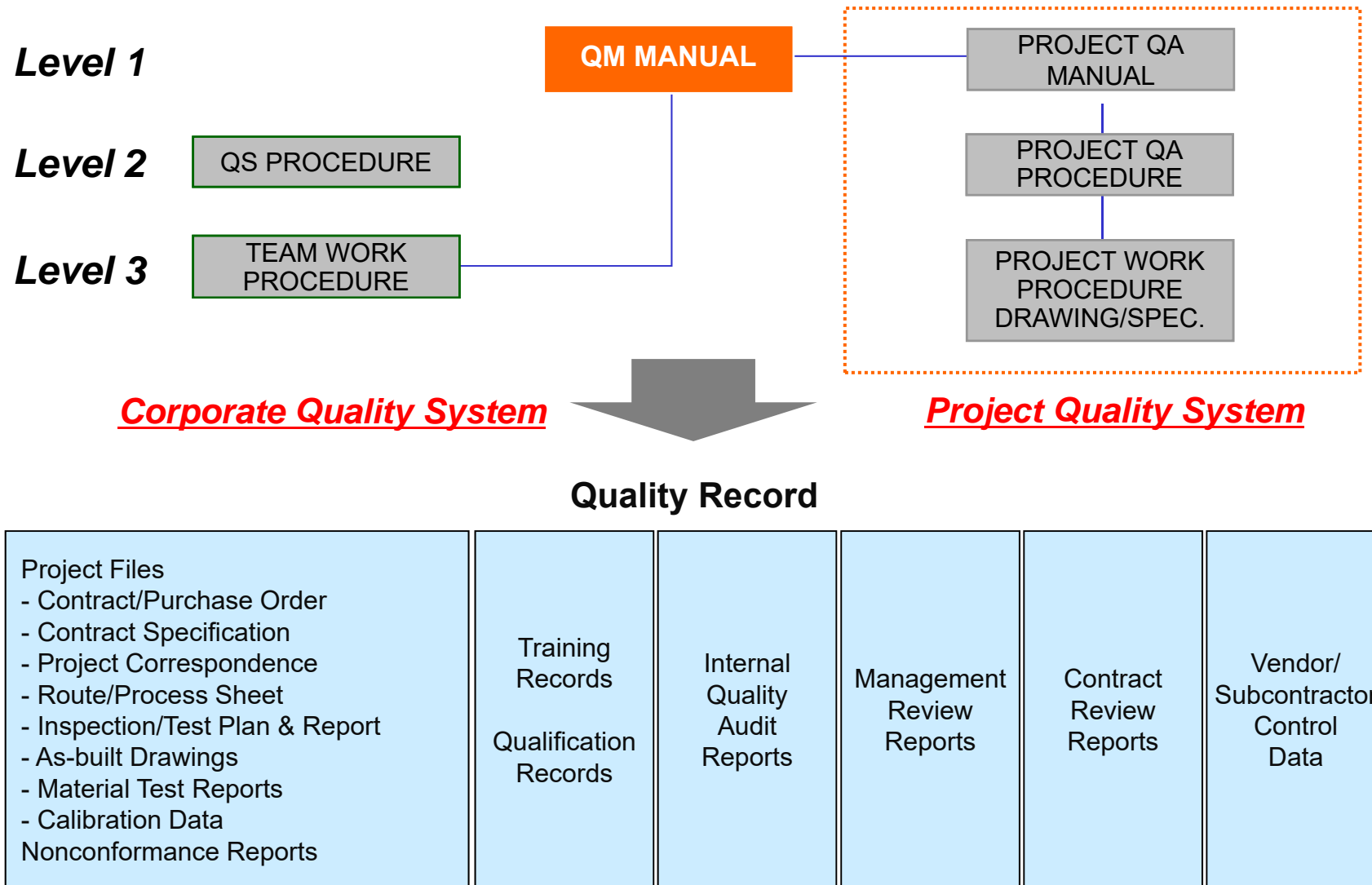
10. Quality Assurance

3) Quality Management System



10. Quality Assurance

4) Structure of Quality Document System



10. Quality Assurance

5) ISO 9001:2015 Certificate

- CAZ has developed Quality Management System to control Total Quality which is included Quality Assurance, Quality Control and Quality Audit
- Renewed Certificate of ISO 9001:2015 on 14. Sep. 2018
- Under Implementation of ISO 14001:2015 & 45001:2018 schedule to achieve on 14. Sep. 2018



Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

CAZ (Thailand) Co., Ltd.
239 Huaypong-Nongbon Road, T. Huaypong, A. Muangrayong, Rayong, 21150, Thailand

has been approved by LRQA to the following standards:
ISO 9001:2015


Basem Obaid - Global Head of Training and Improvement Services
Issued by: Lloyd's Register International (Thailand) Limited
for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: 14 September 2018
Expiry date: 11 January 2021
Certificate identity number: 10134030

Original approval(s):
ISO 9001 – 12 January 2015

Approval number(s): ISO 9001 – 0045427

The scope of this approval is applicable to:

Fabrication of pressure piping and related piping work and structural steel work

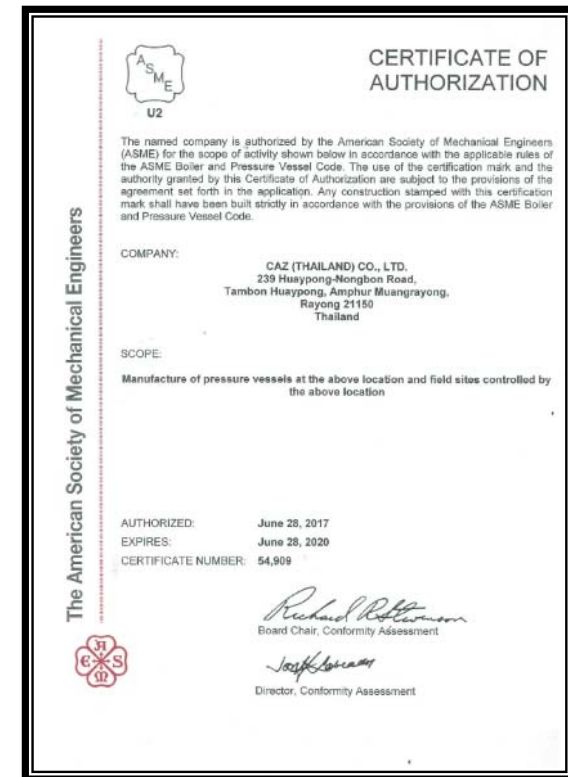
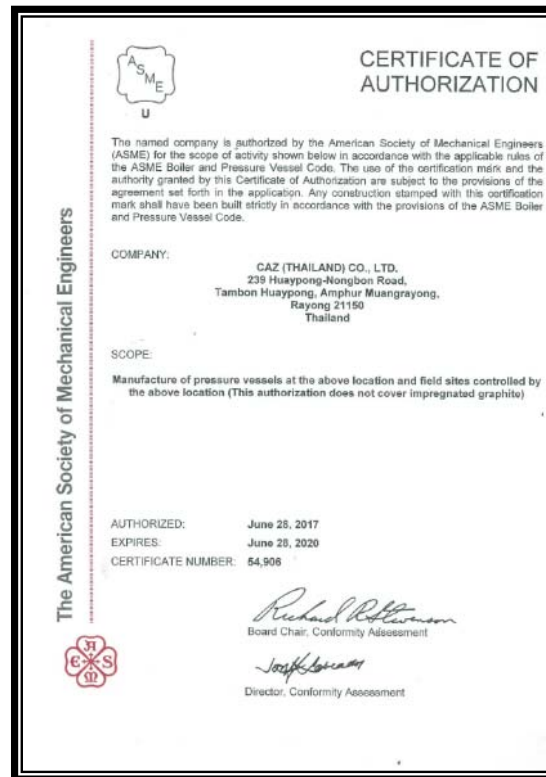

001

Lloyd's Register Group Limited, its affiliates and subsidiaries, including Lloyd's Register Quality Assurance Limited (LRQA), and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or for any other reason, unless that person has agreed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract. Issued by: Lloyd's Register International (Thailand) Limited, 22nd Floor Sathorn Building, 206/70 Rama IV Road, Klongton, Klongtoey, Bangkok 10110, Thailand for and on behalf of: Lloyd's Register Quality Assurance Limited, 1 Tinsley Park, Boulevard Lane, Birmingham B37 7YU, United Kingdom

10. Quality Assurance

6) ASME Certificate

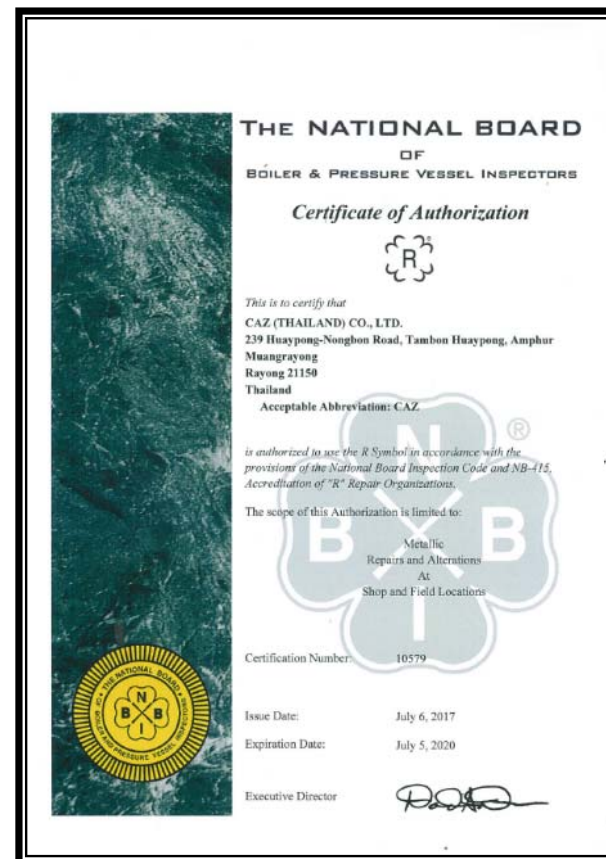
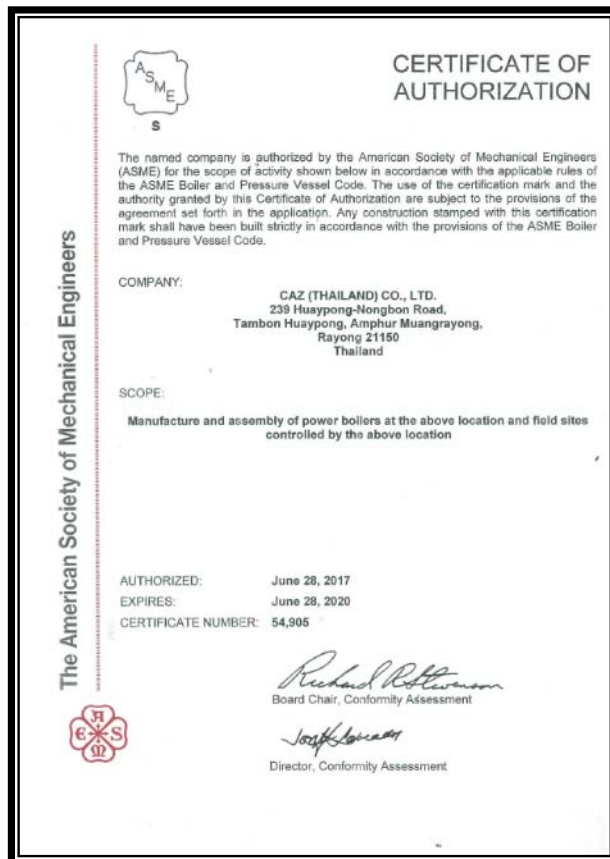
- Approved by ASME Certified Body, Certificates were issued in Jun 2017



10. Quality Assurance

6) ASME Certificate

- Approved by ASME Certified Body, Certificates were issued in Jun 2017



Safety Management System

11. Safety Management System

1) Safety Policy

- Safety Policy -

CAZ (Thailand) Co., Ltd. is committed to providing a healthy and safe work environment for its workers and preventing occupational illness and injury. To express that commitment, we issue the following policy on occupational health and safety.

As the employer, CAZ (Thailand) Co., Ltd. is responsible for the health and safety of its workers. CAZ (Thailand) Co., Ltd. will make every effort to provide a healthy and safe work environment. We are dedicated to the objective of eliminating the possibility of injury and illness.

As CAZ (Thailand) Co., Ltd., I give you my personal promise to take all reasonable precautions to prevent harm to workers.

Supervisors will be trained and held responsible for ensuring that the workers, under their supervision, follow this policy. They are accountable for ensuring that workers use safe work practices and receive training to protect their health and safety.

Supervisors also have a general responsibility for ensuring the safety of equipment and facility. CAZ (Thailand) Co., Ltd. through all levels of managements, will cooperate with the joint occupational health and/or the representative and workers to create a healthy

and safe work environment, cooperation should also be extended to others such as contractors, owners, officers , etc.

The workers of CAZ (Thailand) Co., Ltd. will be required to support this organization health and safety initiative and to cooperate with the occupational health and safety committee or representative and with others exercising authority under the applicable laws.

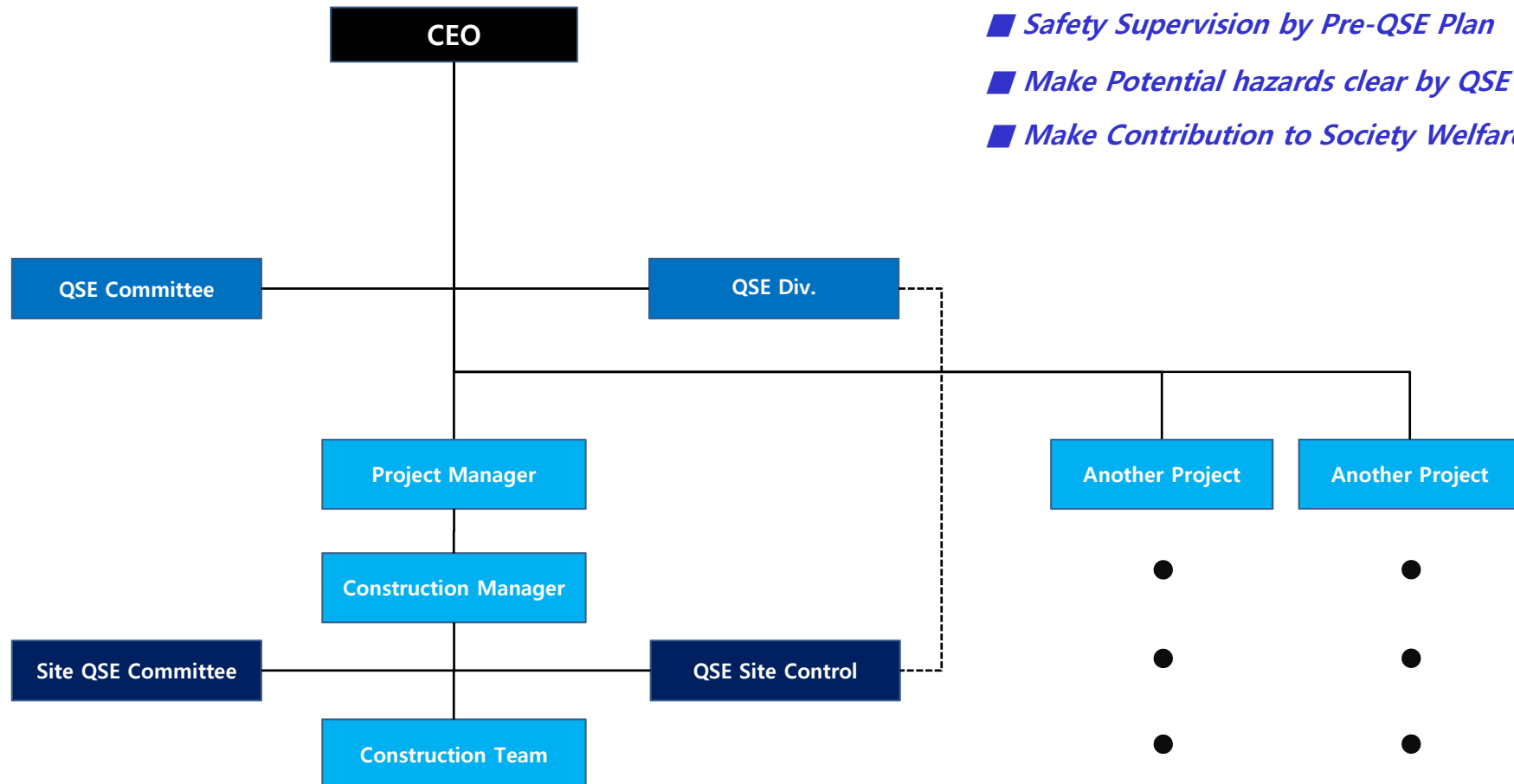
It is the duty of each worker to report to the supervisor of manager, as soon as possible, any hazardous conditions , injury, accident or illness related to the workplace. Also, workers must protect their health and safety by complying with applicable acts and regulations and to follow policies, procedures, rules and instructions as prescribed by CAZ (Thailand) Co., Ltd.

CAZ (Thailand) Co., Ltd. will, where possible, eliminate hazards and, thus, the need for personal protective equipment. If that is not possible, and where there is a requirement, workers will be required to use safety equipment, clothing, devices and materials for personal protection.

CAZ (Thailand) Co., Ltd. recognizes the workers duty to identify hazards and supports and encourages workers to play an active role in identifying hazards and to offer suggestions or ideas to improve the health and safety program.

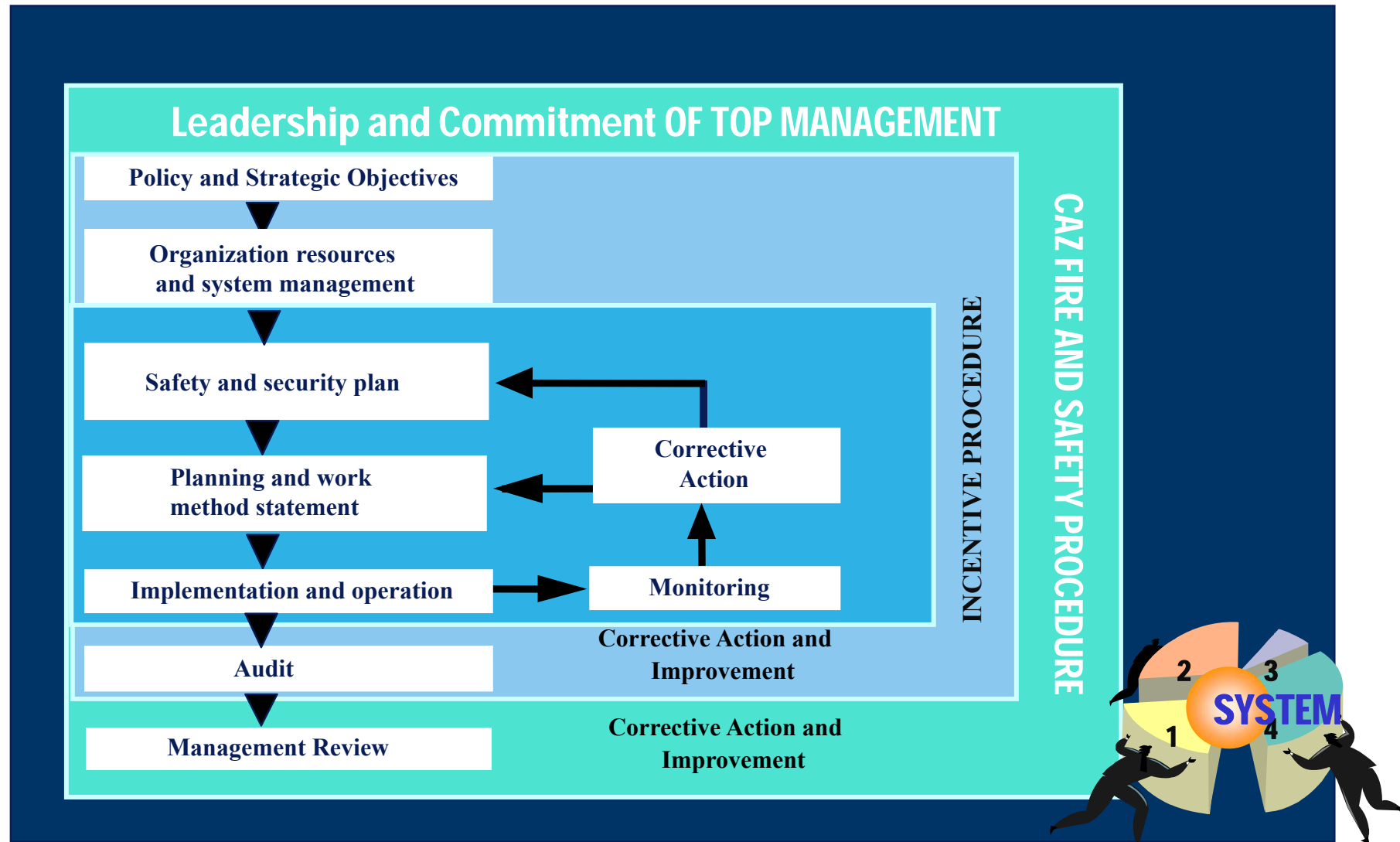
11. Safety Management System

2) Safety Organization



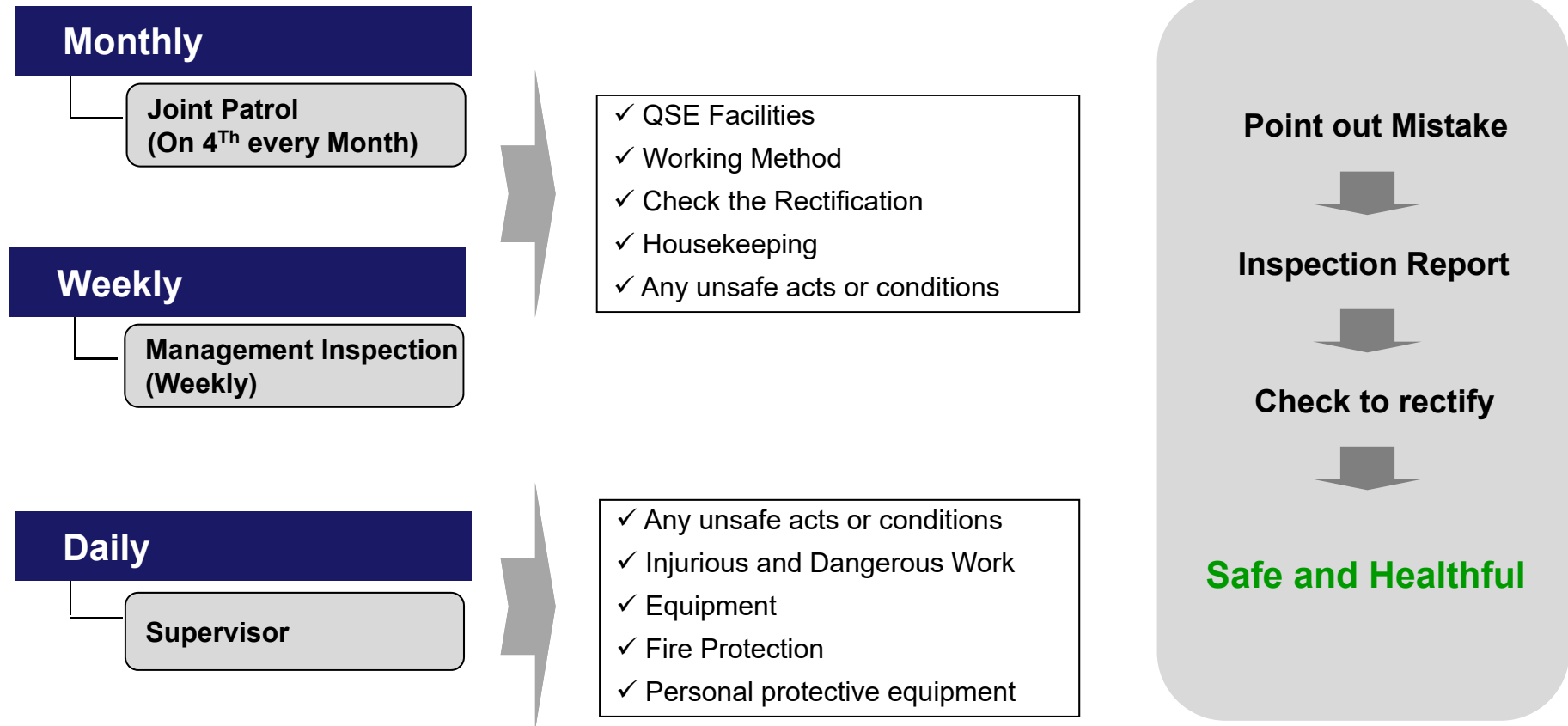
11. Safety Management System

3) Structure of the Safety Management System



11. Safety Management System

4) Audit Plan



11. Safety Management System

5) Safety Rewards

Achieving	2,000,000	Safe Man hours on PTTGC Aromatics Debottlenecking Project
Achieving	6,000,000	Safe Man hours on TOP SPP Project
Achieving	1,000,000	Safe Man hours on GC OXIRANE Project



12. Award of Appreciation from Client



PTTLNG	Outstanding Service	PTT LNG Cold Water Generation
SAMSUNG ENGINEERING	Outstanding Service	PTT Wangnoi Compressor Station
SAMSUNG ENGINEERING	Outstanding Partner	Among all partners





THANK YOU



CAZ (THAILAND)
PUBLIC COMPANY LIMITED